Digitized by the Internet Archive
in 2010 with funding from
University of Toronto

http://www.archive.org/details/n7royalsocietyof43roya

RA
421
R6
v. 43
no. 7
cop. 2

iological
Medical
erials

Vol. XLIII.—No. 7. Issued April, 1923.

LIBRARY
MAR 15 1967
UNIVERSITY OF TORONTO

JOURNAL

OF

THE ROYAL SANITARY INSTITUTE

PUBLISHED MONTHLY.

LONDON:

OFFICES OF THE ROYAL SANITARY INSTITUTE,
90, BUCKINGHAM PALACE ROAD, S.W.1 (Tel: 3739 Victoria).
EDWARD STANFORD Ltd., 12, 13, & 14, LONG ACRE, W.C.2.

PRICE ONE SHILLING NET.

IZAL

DISINFECTANT

THE MODERN HIGH-POWER GERMICIDE

WILL NOT DECOMPOSE, AND RETAINS ITS GERMICIDAL ACTION WHEN MIXED WITH

Hard or Polluted Water, Limewash, Urine, and other Organic Fluids.

NEWTON, CHAMBERS & Co., Limited

THORNCLIFFE,

Nr. SHEFFIELD.

BY APPOINTMENT

IZAL

The Fragrance and Health-Preserving Properties of

"SCOUT"

THE IDEAL HOME SOAP

Will appeal to all Sanitary Officers.

Being absolutely pure, it can be used regularly for the TOILET and BATH.

Obtainable from Grocers, Chemists, and Stores at

PER 7d. CARTON OF 3 TABLETS.

EDWARD COOK & CO., LTD., BOW, E. 3.

VOL. XLIII.—No. 7. Issued April, 1923.

JOURNAL OF THE ROYAL SANITARY INSTITUTE.

Telephone: VICTORIA 3739.

Telegraph: SANITUTE, CHURTON, LONDON."

Contents.

Lectures on Tropical Hygiene—

"The Sanitary Inspector in the Tropics," by Andrew Balfour, C.B., C.M.G., M.D., B.Sc., D.P.H. 321

"Water and Water Borne Diseases in the Tropics, by Lieut.-Colonel Wm. Wesley Clemesha, C.I.E., M.D., D.P.H. 330

"Parasitic Worms and their Migrations," by R. T. Leiper, D.Sc., M.D. 331

"Flies and Mosquitoes," by Lieut.-Colonel H. J. Walton, M.D., F.R.C.S., I.M.S. (retired) 334

Articles Contributed—

"Experiments made with Larvivorous Fish in British Honduras," by John H. Peach ... 335

"Sewage Disposal in British Guiana," by John H. Peach 337

"Preventive Medicine in Australia," by W. G. Armstrong, M.B., Ch.M. D.P.H. ... 339

OBITUARY—The Right Hon. the Earl of Plymouth 352

Supplement—

Reviews of Books 117
Meetings Held 121
General Notes 122
Forthcoming Meetings 123
Hull Congress 124
Elections 127

LIST OF ADVERTISERS.

The numeral indicates the page on which the Advertisement appears; the dash (— denotes that Advertisement is not in this issue.

Activated Sludge, Ltd. x
Bayliss, Jones & Bayliss, Ltd. .. —
Berkefeld Filter Co. (British) ... vi
British Commercial Gas Assn.... —
British Electrical Development Assn .. .. —
British, Foreign & Colonial Automatic Light Controlling Co., Ltd. ... ... —
Broad & Co. Ltd. v
Burn Bros. (London) Ltd. ... iv
Cadbury Bros., Ltd. ... ...
Candy Filter Co., Ltd. ... ... —
Claughton Bros., Ltd. ... ... —
Cook, Edward & Co., Ltd ... i
Crapper, Thomas & Co., Ltd. .. iv
Dominion Machinery Co., Ltd.... —
Doulton & Co., Ltd. ... ... —
Educational Supply Assn., Ltd. —
Ferodo, Ltd. viii
Flavel, Sidney & Co., Ltd. ... —
"Glaxo" ... ... —
Harley, T. viii
Harpic Co. ... ... —
Harrison, G. W., & Co. ... ... —
Holts Patents, Ltd. iii
Horlick's Malted Milk ... ...
Horton Manufacturing Co., Ltd. vi
Jennings, George ... ... —
Jennings, George, Ltd. ... ... —
Kay Bros., Ltd. ... ... —
Kirkby, Fairbank, Ltd. ... ... —
Lewis, H. K. & Co., Ltd. .. ... —
Macfarlane, Walter, & Co. ... v
Manlove, Alliott & Co., Ltd. ... xi
Meldrums, Ltd. ... ... —
Minimax, Ltd. vii
Newton, Chambers & Co., Ltd.... i
O Bruster & De Launoit ... iii
Pontifex, H., & Sons, Ltd. ... —
"Ronuk," Ltd. iii
Royal Society for the Prevention of Cruelty to Animals ... ... —
Sankey, J. H., & Son, Ltd. ... —
Septic Tank Co., Ltd. ... ... —
Sharp, Jones & Co., Ltd.... ... —
Silicate Paint Co. vi
Slack & Brownlow ... ... —
Salter, George & Co., Ltd. ... —
Smethurst, Herbert & Sons, Ltd. ... ... —
Tintometer, Ltd. ix
United Alkali Co., Ltd. ... ...

Particulars of the Arrangements for Advertising in the Journal can be obtained from the Offices of the Institute.

The Boiler that can be relied upon to do its work is

The "GLOW-WORM."

The **ORIGINAL** Boiler of this Design and the **only one** with **efficient** Hot-Plate on which you can **really** boil and cook.

1. **Maximum Efficiency.**
2. **Minimum Consumption of Fuel.**
3. **Low Cost.**

Size No. 1. Raising 42 gallons 100° per hour, listed at ... ... **£12 10s. 0d.**

Size No. 2. Raising 56 gallons 100° per hour, listed at ... ... **£14 10s. 0d.**

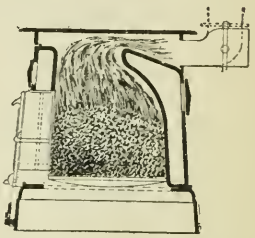
Made with **Shaking Bottom** for use with Coal, Coke, or Anthracite, and **will consume Household Refuse.**

Size No. 1 provides for—

Abundant Hot Water, Day and Night.
A Hot Bath every 15 minutes.
A small Radiator System, Towel Rail etc.
Warms the Kitchen.
Simple Cooking Operations.
A Fire always visible.
An Open Fire for Toasting and Heating Irons.

ALL AT A COST OF ABOUT 6d. PER DAY.

NOTE THE CONSTRUCTION!



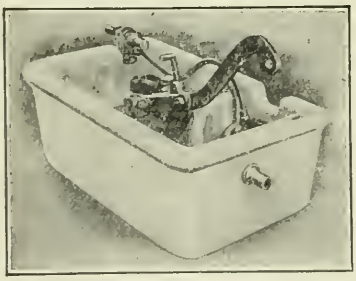
See how the baffle directs the heat on to the hob.

Can be connected to existing Hot Water Installation.

Sole Manufacturers (British Make. Registered Design):

O. BRUSTER & DE LAUNOIT, 4, LLOYD'S AVENUE, LONDON, E.C. 3.

MAKERS OF THE FAMOUS "BASECO" PATENT BOILER.



"SWAN" FIRECLAY CISTERN

commended by the Judges BOURNEMOUTH EXHIBITION, 1922.

ALL NOISE IN CISTERN DISCHARGE EFFECTIVELY REMOVED by the

"SWAN" SILENCER

Can be fitted to any type of syphon cistern.
Price 25/-.

Awarded Bronze Medal, R.S.I. Exhibition Bournemouth, 1922.

TO MANUFACTURERS:—The "Swan" Silencer can be fitted to any type of water waste preventer.

AGENTS WANTED.

HOLTS PATENTS LTD.,
29 & 31, Westmoreland Street, Liverpool.

BY ROYAL WARRANT — TO H.M. THE KING.

POLISHED FLOORS.

RONUK, Ltd.

are prepared to ESTIMATE for the Polishing and the Maintenance of all kinds of Floors in

HOSPITALS, INSTITUTIONS and PRIVATE HOUSES.

Write for Pamphlet.

Manufacturers of

"RONUK" SANITARY POLISH.

Awarded Gold Medal at XVIIth International Congress of Medicine, and Six Medals by the Royal Sanitary Institute, including the highest and only Awards ever granted to a Polish.

Head Office and Factory—

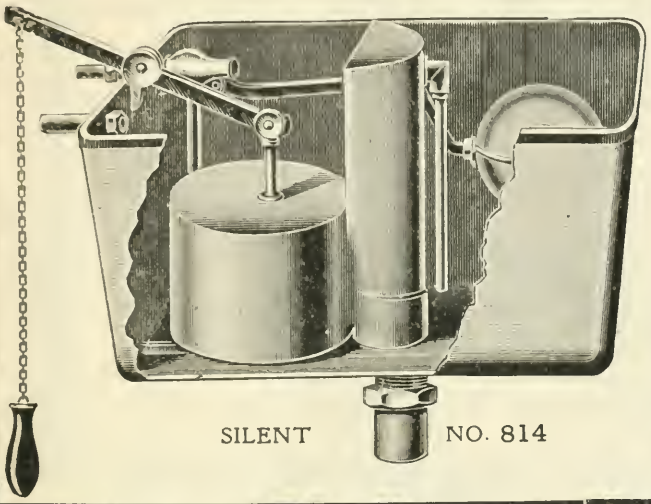
'RONUK' LTD.,
Portslade, Brighton, Sussex.

Depots: LONDON, 16, South Molton Street, W.; MANCHESTER, 285, Deansgate.

SANITARY ENGINEERS
BY ROYAL WARRANT OF APPOINTMENT
TO HIS MAJESTY THE KING.

Telephone: Kensington 3711 (2 Lines).

Thomas Crapper & Co., Ltd.



SILENT NO. 814

120, KING'S ROAD,
CHELSEA,
LONDON, S.W. 3.

Silent & Easy Pull
Valveless
Water Waste
Preventers.

BATHS, LAVATORIES, SINKS.

Syphonic, Large-area and other Pedestal Closets.
Intercepting Traps.
Manhole Covers, etc.

BURN'S PATENT GROOVED SOCKET SOIL and WASTE PIPES.

Observe corrugations shown in section.

Cast with grooves in the socket, which prevent the lead jointing being withdrawn by expansion and contraction due to variations of temperature or by hot water.

Invaluable for tropical climates.

Internal surface of pipes specially smooth.

Stocked in London County Council weights.

Prices same as for ordinary L.C.C. pipes.

Sole Manufacturers :—

BURN BROTHERS (London) LIMITED,

3, BLACKFRIARS ROAD,

Also at EDINBURGH. **LONDON, S.E. 1.**

High-class
SANITARY WARE

EVERYTHING required in Sanitation can be supplied by us. Is it something ordinary?—we will quote you competitive price compatible with quality. Is it something out of the ordinary?—most likely it is already in our list and stock. If not, we will make it at our works satisfactorily and quickly. That is the advantage of dealing with Broads. We are both Manufacturers and Merchants.

BRICKS, PORTLAND CEMENT, FIREGOODS, DRAIN PIPES, SANITARY GOODS, CASTINGS, &c.

Telegrams: "Broadanco, London."

BROADS

BROAD & CO., LTD.

Telephone: Paddington 8 (3 lines).

4, SOUTH WHARF, PADDINGTON, W.2

TRADE MARK ON WALTER MAC FARLANE & Co GLASGOW SARACEN FOUNDRY EVERY CASTING.

Macfarlane's Castings.

PLAIN & ORNAMENTAL, OF EVERY DESCRIPTION.

FIRST CLASS AWARD
International Sanitary Exhibition, London.

GLASS ENAMELLED DRAIN AND SOIL PIPES
AS SUPPLIED TO ROYAL RESIDENCES.

WALTER MACFARLANE & CO.,

GLASGOW.

Architectural, Sanitary and General Ironfounders.
Illustrated Catalogue, Price List, and Estimates on Application

Volume XLIII. No. 7. Issued April, 1923.

JOURNAL

OF

THE ROYAL SANITARY INSTITUTE

The Sanitary Inspector in the Tropics, by ANDREW BALFOUR, C.B., C.M.G., M.D., B.Sc., D.P.H., F.R.C.P.E. (Fellow).

Being Lecture delivered at the Institute on November 20th, 1922.

IF the Royal Sanitary Institute were an Army organisation I am inclined to think it would be incorporated with the Pioneers and have emblazoned on its standards the proud motto *Primus in campo.*

At any rate, it has, I think, been first in the field in all questions relating to the training and examination of sanitary inspectors, and now it has taken the lead, not only in the institution of examinations in tropical hygiene for these inspectors, but in arranging a short course of lectures on the same subject for their benefit and instruction.

I look upon these two later developments with especial satisfaction, for they are in some measure the realization of a scheme which I have advocated for many years, until recently in vain. I have felt like a voice crying in the wilderness, but now, still retaining the simile of the desert, I would liken myself in all humility to the traveller who, feeling his situation hopeless amongst arid wastes, suddenly lifts up his eyes and descries close at hand an oasis, the goal of his endeavours.

It is true that no one, neither the examiner nor the examinee, would probably describe either the written test or the *viva voce* as anything of the nature of an oasis, a place of peace and restfulness, but a little poetical licence is surely permissible, while perhaps the course of lectures may fittingly be compared to those gifts of food and drink which the oasis furnishes to the hungry and thirsty wayfarer.

At any rate there is the intention of providing mental pabulum to the anxious enquirer destined to labour under tropical conditions and to serve the goddess Hygeia within the torrid zone.

Whether The Royal Sanitary Institute is the proper body to establish *regular* courses of such instruction is another matter. Personally, as I have said elsewhere, I think this is a duty which might well be undertaken by the forthcoming Imperial Institute of Hygiene, for, presumably, this great undertaking will possess peculiar facilities for teaching denied The Royal Sanitary Institute and will be better able to obtain the material necessary for the somewhat specialised training required. At the same time we may, I think, congratulate The Royal Sanitary Institute upon leading the way in this particular. Thereby it directs attention to the importance of the matter, raises a milestone on the road of progress and encourages those who see a bright future for the trained sanitary inspector in the tropics. Of its usefulness as an examining body in tropical hygiene there can be no doubt. Already a promising start has been made, fifty per cent. of the candidates presenting themselves having been rejected. This sounds alarming, but when I say that there have only been four all told the statement becomes less formidable. All the same, half of those seeking the special certificate failed to satisfy the examiners, and in the comparatively restricted field of tropical hygiene the fact is not without significance. I think I am right in stating that the two who passed were men who had held appointments abroad. In other words, they had received practical training while the other two had done the best they could by the study of books, unaided by advice from teachers familiar with tropical conditions and unable to obtain any instruction in the field. Yet, believe me, in and about London it would be by no means difficult to arrange a good practical course for the sanitary inspector destined for hot climates.

In the first place let it be remembered that the tropics are yearly becoming what we may call more civilized from a sanitary point of view. They are in certain respects passing through the phase which this country traversed some sixty years ago.

Hence the ordinary, every-day experience which the inspector gains in England or in Scotland, in Wales or in Ireland, will in many ways prove quite useful to him. Indeed, it forms the bed rock of his training, for the principles governing hygiene in the tropics are those which determine its operations here.

On the other hand, there are marked differences in the details and execution of sanitary work in a hot climate as compared with what obtains under home conditions.

At the British Medical Association Meeting in Birmingham in 1911 I ventured mildly to speak of these facts and was surprised when an irate

though polite gentleman arose and gave me the lie direct. He assured the company that no distinction could be drawn between hygiene at home and in the tropics, that there was no need for special training in tropical hygiene, that in short I had been talking nonsense. Now I do not know where my antagonist had lived or what had been his experience. I intended asking him, but happily there was no need, for the late Dr. Albert Chalmers, then home from Ceylon, got upon his feet and pulverised him. There can be no doubt he belonged to the class with defective mental outlook, the class which opposed, fortunately in vain, Sir Patrick Manson when he started to found a School of Tropical Medicine.

In the second place there are some subjects which have a special bearing on sanitation in the tropics and which lend themselves excellently well to exposition in and about the metropolis.

Surely there is no need to remind even the home-trained sanitary inspector that in the tropics and the sub-tropics the mosquito will prove itself one of his greatest foes. It is his duty, and should be his pleasure, to abolish its shrill note of triumph, to destroy it in all its stages, to hunt it with the persistence of a sleuth hound and the energy of a water spaniel. For one thing it, or rather she, will do her best to render his life miserable when he arrives fresh and succulent in foreign parts, for another, as Colonel Walton will doubtless explain next Thursday, malaria, dengue, yellow fever and filariasis are all gifts from the blood-loving gnat. In India there are published every year statistics showing how many people are killed by snakes and what are called wild animals. The lists would shrink to paltry insignificance if contrasted with others indicating those who perish annually from wild insects, and amongst those wild insects the mosquito, and more especially the anopheline mosquito, is *facile princeps*.

Hence the sanitary inspector must wage war against the gnat, but to do so he must be familiar with the winged terror in all the stages of its wonderful and fascinating career. He can do so perfectly well within the radius of a few miles of this Institute. It is true that *Culex fatigans*, the common brown gnat of the tropics, a greedy blood-sucker and one of the vectors of filariasis, does not occur in England, but *Culex pipiens* is its twin sister and is easily found. Some years ago I was asked to investigate a plague of mosquitoes in a London tube railway. Employees of the Company were being badly bitten in a cul-de-sac where carriages were kept and where the temperature was high. Some had developed septic wounds and were claiming damages. It was all very interesting. One hundred and twenty feet below ground level we found the mosquito nursery in a sump pit. When the cover was removed the insects emerged in hundreds, much to the amazement of passengers on the platform. It

would have been a fine lesson for any sanitary inspector, as would also have been the way in which the mosquitoes and the complaints and the anxiety of the Company were all abolished by the use of a little sanitas okol.

But you may say, " What about anophelines?" Here again there is no difficulty save in the way of railway fares. Not far off, in Surrey, the inspector can be initiated into the breeding mysteries of three anophelines, all malaria carriers, one clear winged, two with wings spotted; in one species like the pard, in another like those of tropical anophelines, that is to say along the costa or upper margin.

The nurseries are in many ways similar to those in hot countries, pools, streams, ditches, rot-holes in trees and so on, and it is easier and more comfortable to prowl about them in Surrey than, say, in the Sudan. You can vary the scene and go to Kent and you can bring back much spoil in the way of larvæ and pupæ and continue your studies in the laboratory.

Second only in importance to the mosquito and in some places usurping first place, though not " wild " like the anopheline, comes the ubiquitous house fly. It is not always the *Musca domestica* of England, but it has the same filthy habits, the same mode of reproduction and the same, nay rather, a much greater importance as a spreader of disease. Now it is quite easy to learn all about the fly in London, but it is surprising how many sanitary inspectors are a bit shaky on the subject. During the war I met lots of them who had never seen a fly puparium. If they are going to the tropics they must concentrate on the fly, and not only the house fly, but the stable fly and the blue bottle.

Then there is the question of vermin. In its widest sense the word denotes all kinds of noxious things, including the black beetle and the exceedingly important and lively flea, but in nine cases out of ten it will give rise to thoughts of the loathly louse. This parasite of man can easily be studied in London. Not only so, but the methods of getting rid of it on a big scale can be seen in operation no farther away than Whitechapel. There, near the London Hospital, a large lousing, or, as some term it, delousing station exists. Such establishments are certain in the future to figure more largely in hot countries. It is true that typhus is not very common in the tropics, but it is common, indeed an important disease, in sub-tropical lands such as Egypt and Palestine, while recent work by Cragg indicates that in parts of the United Provinces in India it is by no means infrequent.

In any case the louse conveys the spirochaete of certain forms of relapsing fever both in sub-tropical and tropical lands, and hence it is the business

of the sanitary inspector to pursue the creature, and he will enjoy the hunt all the more if he knows something about its habits, its anatomy and its family life.

To some the word vermin will also suggest rats, and the inspector must be thoroughly versed in all matters relating to the cunning rodent, for wherever he may be employed abroad there is a risk of plague and, in addition, he may find that rats require his attention in connection with infectious jaundice and rat-bite fever, as well as on general grounds. Rats and rat destruction can readily be studied in London, not only ashore, but aboard ships at the docks, and, apart from rats, the hygiene of ships and quarantine measures generally can be brought under surveillance. The sanitary inspector, if employed in any post in the tropics, will find a preliminary training in these matters of the greatest importance.

Tinned foods and refrigerating processes for food stuffs are intimately connected with ships and ship life and they are equally prominent in the hygiene of the tropics. The inspector will do well to make himself conversant with all known facts regarding the examination and rejection of canned goods, frozen meat and the conduct of what are sometimes still called "ice-houses."

One cannot think of ships without visualising water, not necessarily salt water, and in matters pertaining to the purification of water a sure foundation of knowledge can be laid in London town. More and more, chlorination is coming to the fore and undoubtedly it has a great future before it in tropical countries, more especially if the chlorine can be obtained in gaseous form. The use of chlorine gas stored in cylinders according to the methods practised by the Paterson Engineering Company or the United Water Softeners, Limited, can readily be studied as applied to London water by the Metropolitan Water Board. Quite apart, too, from gaseous chlorine, the inspector can be made familiar with the new stable mixture of bleaching powder and quicklime introduced by the Hygiene Department of the Royal Army Medical Corps and specially suitable for use in warm climates. No doubt, also, later on he will have a chance of studying the apparatus recently devised by Hutchinson in India whereby a stable chlorine water can be produced electrolytically and exceedingly cheaply from a mixture of salt and lime.

Again, he may have opportunities of seeing how copper sulphate is employed to get rid of algæ, so troublesome in many tropical water supplies, and at the same time gain some idea of how it may be utilized in destroying those snails which function as the intermediate hosts of human schistosomes.

In many parts of the tropics the sanitary inspector will find that in matters hygienic, and more especially those concerned with the disposal of excreta and refuse, improvisation is the order of the day. The coat has to be cut to suit the cloth and frequently the latter is exceedingly scanty owing to lack of funds. Nowadays he can get quite a fair idea of the improvisations adopted in camp life, in Army camps, the camps of boy scouts, in the arrangements made for hop pickers and so forth. If he only keeps his eyes open he can soon pick up a great deal which will be useful to him abroad.

Lastly, while much that he already knows about buildings will prove of value across the seas, he can also acquire some ideas as regards tropical dwellings, for the summer bungalow with its verandah is abroad in the land and some lessons can be learned from its planning and construction.

The list might possibly be extended, but it need merely be said that what he cannot acquire in the field he can pick up in the museum. There are in London places where his education in the problems of tropical hygiene can at least be commenced, and a visit to the central hall of the Natural History Museum at South Kensington is strongly to be recommended as a first step in this direction.

Given then a sound course of study, both practical and theoretical, ere he fares foreign he will find that much time has been saved and that he will be able to enter much more intelligently and to better effect generally upon his new duties.

I sometimes think that in this country the sanitary inspector knows too little about what may be called the laboratory side of his profession. He talks familiarly, sometimes even glibly, about diphtheria bacilli, tubercle bacilli, streptococci *et hoc genus omne*, but beyond knowing that bacilli are rod-like and cocci spherical he sometimes cannot visualize them more minutely because he has had little opportunity of studying them. Perhaps after all it does not very much matter here and no one wishes to turn the sanitary inspector into a pundit. The essence of his existence should be practicality. In the tropics, however, where protozoology plays so large a part in human pathology, where important epidemic diseases are due to a great diversity of creatures and where these creatures possess in some instances complex life histories, it is important that he should acquire a reasonable working knowledge regarding them.

The inspector should be conversant to some extent not only with bacilli, like those of plague and cholera, and with protozoa, like the malarial plasmodium and the entamoeba of dysentery, but with those worms which so adversely affect human life and effort in hot climates.

All this knowledge will bring joy and interest to him in his work. He

need not be examined about such things, but he should examine himself to see if he has a grasp of essentials, if he understands the why and the wherefore of his work, to make sure that he is not merely a diligent mole.

Even so, however, he will find that he has much to learn when at last he lands somewhere between Cancer and Capricorn, and he has to learn by experience, often sad experience, though the latter is less likely to be sad if he has been well grounded. At the outset, however much he knows, it will take him a little time to understand how to take care of his own health. As an apostle of hygiene it is but fitting that he should soon acquire that knowledge. He must watch the sun, take care of chills, be careful in his diet and still more careful in his drink. He must learn that it pays to take regular exercise, even though he may feel that he gets plenty of exercise in the discharge of his duties. He must learn to respect the mosquito as well as hate her and carefully place a folded newspaper on a cane-bottomed chair before sitting on the latter. He will certainly learn more about his skin and his kidneys in a few weeks than he would have all his life had he stayed at home, but with any luck he will wrestle through; in other words, he will become acclimatised. In the meantime he will probably find that he is a Jack of all trades and he may discover even thus early that he has sometimes to do two men's work.

We shall see upon the screen the kind of duties the inspector has to perform, or rather the various subjects which will engage his attention, though, truth to tell, one would have to exhibit lantern slides from now till doomsday to give an adequate idea of all his functions, ranging from the care of conservancy animals to training his black or coloured assistants. I wish, however, to affirm, I believe truthfully, that he will never be wholly successful unless he bears constantly in mind the fact that his work is not only onerous but honourable. It is not always easy for him to do so. Too often he is looked upon by ignorant people as a mere bucket remover or as an irritating, officious person who collects evidence on which they are fined. They, and amongst them, sad to say, the administrator sometimes figures, do not realize all for which the sanitary inspector stands. I have no wish to say anything which might give the latter an "unco' guid conceit" of himself. I am not dealing with the individual, but with what he represents. He is just like the Medical Officer, a link in the administrative chain, not so big a link, but an essential one which should be free from flaws.

In certain directions, however, his duties are specialized. In the whole range of executive officials there is no one who is brought as closely into contact with the life and well-being of the community, be it white or black. It may indeed be said that he is in touch with the individual from the cradle

to the grave, or whatever other means are employed for the disposal of the dead. He is concerned with the milk supplied to babies, intimately connected with almost every common act of life, and comes more or less into association with every member of the population till he or she is buried or burned. Even thereafter he is not free from his responsibilities, for he has to look after the condition of cemeteries and burning ghâts. He bears a heavy burden and must never forget that the preservation of human life depends upon his efforts and energy. He is very open to criticism and obstruction even when he faces risks calculated to deter the stoutest heart. It must never be forgotten that the sanitary inspector is usually the first, or at least one of the first, to enter the house of death. Protected by vaccination he may tackle small-pox cases with impunity, but it is a different matter when his duties bring him into close contact with pneumonic plague, cholera or cerebro-spinal fever amongst a native population or when he finds himself in the midst of one of those devastating epidemics of influenza which sweep away thousands and against which his safeguards are frail. It is well for him then if his fighting spirit is aroused and his sense of duty triumphs over any fear of his surroundings.

Still, it is not under such conditions he is likely to fail. It is rather in the hum-drum of his daily vocation when he feels worn out by climatic difficulties, when he finds he is not appreciated by those he is trying to help, when the disagreeable aspect of his work bulks too largely, when progress seems so very slow and leave so far away.

It is hard to be always tactful and pleasant under those circumstances, to endure with fortitude, to keep a stiff upper lip. Help, however, will be forthcoming if he remembers that through it all he is playing a part in truly imperial work.

It is said, nowadays, and perhaps with some truth, that one of the reasons for unrest and trouble in India is that there has been an influx of Britishers who do not act up to the old standards which the native respected and admired even though they were very different from his own. In short, that the Sahib is diminishing in numbers.

Now what the native means by a Sahib, and there is no one, believe me, so quick at summing up a man's character as our brown or black brother, is not necessarily a person of means and position and high birth, but a man who plays the game. The true translation of the word Sahib is "Nature's gentleman," and this every sanitary inspector can in a sense become if he is not one already. It is not always easy, for he will find temptations put in his way throughout those lands of backsheesh and he will be hard put to it to keep his temper and not assault some offending sweeper, and he may think after all what does it matter if a few more

niggers (a bad word too commonly used) go under, but he must never forget that it is not only himself but his country that will be judged by his behaviour. He comes into more intimate relation with the native population than anyone else, and if he will only study them and their peculiar habits and religious observances and make due allowances and temper mercy with justice he will reap his reward and play no small part in spreading that *Pax Britannicum* of which we once heard so much but nowadays see so little, possibly because these very qualities of which we have spoken are not so prominent as was formerly the case.

One cannot, however, always be an idealist or live at concert pitch. Hence it is just as well to remind the sanitary inspector in the tropics that his work has a most important bearing from an economic standpoint. He will find that financial secretaries and people of that sort usually view this side of the question in quite a different way from that which I wish to lay very briefly before you. As a rule they see nothing but the debit side. It is not surprising, for they often find it desperately hard to make both ends meet. But human life has a very distinct monetary value and figures are slowly accumulating, mostly from American sources, which clearly explain that value in terms of hard cash. There is no opportunity to quote these statistics to-day, for we must turn to the lantern slides. In any case statistics are always rather a dry subject to the ordinary mortal, but the time will come when every Governor of a British Colony or Dependency and every high official in British India and elsewhere in the British tropics will have to be familiar with these facts and figures and recognise that it pays, pays handsomely, to encourage the kind of work which falls to the inspector's share.

Meanwhile the latter will do well to recall Kipling's "If" and all it means:—

> "If you can keep your head when all about you
> Are losing theirs and blaming it on you,
> If you can trust yourself when all men doubt you
> But make allowance for their doubting, too,
> If you can wait and not be tired by waiting
> Or, being lied about, don't deal in lies
> Or, being hated, don't give way to hating
> And yet don't look too great nor talk too wise."

Then, bearing in mind the abiding interest of his profession, the fact that his work properly performed spells money saved to the State, the still greater fact that he is privileged, in however humble a way, to preserve human life and, lastly, that he himself is not altogether a mere cipher in imperial affairs—keeping all these things in view—he should shoulder his burdens with fresh courage and with the confidence born of optimism.

Water and Water Borne Diseases in the Tropics, by Lieut.-Colonel Wm. Wesley Clemesha, C.I.E., M.D., D.P.H. (Fellow).

Being résumé of Lecture delivered at the Institute on November 21st, 1922.

THE diseases that the Sanitary Inspector will find in the East to be connected with the water supply are first, cholera; secondly, dysentery and diarrhœa; and thirdly, enteric.

For the purposes of the lecturer, cholera was taken as a typical water borne disease in tropical countries. The various sources of water supply were then described and illustrated; these being usually in the East, the ordinary village shallow well, the tank or pond, rivers and streams.

As regards the shallow well, pictures of how these were actually contaminated were thrown on the screen. These principally consisted of photographs showing people standing over the mouth of the well, washing clothes and bathing in close proximity so that the contaminated water could actually flow back into the well itself. Everyone conversant with the East knows that this is extremely common in the village well that is out of repair. The picture of a thoroughly satisfactorily constructed well was then thrown on the screen and its various points described, the most particular one being that it was shut in by a dome roof, the water being obtained by means of a simple pump. The advantages and disadvantages of pumps for public use in tropical villages were described and it was pointed out that they were for the main part entirely unsuited to public wells though they answered more or less satisfactorily in private compounds.

Norton's Tube Well was then explained and pictures shown. The advantages of this, in that it is almost impossible to contaminate the supply, were pointed out, but here again the pump is the main difficulty for use by the public.

Concerning tanks or ponds, pictures were shown of contaminated tanks and also of large ones which give a good supply. Arrangements for constructing a " reserve tank " were also given; these consist of fencing in the pond, diverting surface drains as far as possible, and providing a sentry to prevent bathing, washing of clothes and watering of cattle in the pond, etc.

As regards rivers, these not infrequently distribute cholera over a very wide area if they are running very rapidly and are grossly polluted, as is usually the case in the monsoon period; in the dry weather water taken from the middle of large rivers is usually fairly safe; that at the edge must always be looked upon with grave suspicion.

Parasitic Worms and their Migrations, by Prof. R. T. Leiper, D.Sc., M.D. (Member).

Being résumé of Lecture delivered at the Institute on November 22nd, 1922.

ALTHOUGH the Parasitic Worms are uninteresting to look at, and revolting in their habitat, they play an important part in the causation of ill-health in the Tropics, and one finds unexpected romance in their lives. But I shall hope to convince those of you who have been trained in Sanitary Science in this country that the hygienic control of disease as you have learnt it, based as it is upon the science of bacteriology, is in many respects inapplicable or futile in the Tropics, where many of the diseases are caused by animal organisms, which differ absolutely in their mode of spread from the diseases of cold climates.

The first important contrast between bacterial diseases and helminthic or worm diseases, is that while bacteria multiply within the animal body in enormous numbers, the parasitic worms are unable to produce further individuals inside the body. If there are, say, 80 Hookworms in the gut as the result of their presence giving rise to toxins which produce anæmia, and the Physician by treatment removes 60, the patient will probably recover from the disease through the lessening of the toxic substances produced, for the remaining 20 cannot give rise to a new crop of Hookworms in the patient.

The bulk of the parasitic worms, of which there are over 80 species in Man, live in the alimentary canal. A few live in the bile ducts, in the lung, in the blood vessels, connective tissues and lymph glands. All of them produce enormous numbers of offspring, but these offspring must sooner or later leave the body and make their way, after a period of delay, into another body, or back again into the same body before they can attain to adult stage.

The worms give rise to their progeny usually as eggs, less commonly as hatched young, and in the case of the parasites living in the gut, in the bile ducts, and in the blood vessels in the wall of the gut, these eggs are passed in the fæces. By examining the fæces one can detect the eggs of the worms microscopically and can actually distinguish the individual species of worm by the characteristic design of the egg. Even in the case of infection of the lung by the lung worms (*Paragonimus*) one can make a diagnosis from an examination of the fæces, for the eggs given off by the parasite are carried up the trachea in the sputum, and, being swallowed, become mixed with the intestinal content.

In the case of the Bilharzia worm which invades the blood vessels of the bladder, the eggs pass through the bladder wall into the urine and can similarly be identified by microscopic examination of the urine. The worms which live in the connective tissue and in the lymph vessels and glands give birth to young which circulate in the blood stream. These are removed from the blood stream by certain blood-sucking flies.

Lastly, there is the extraordinary parasite the Guinea Worm, which grows under the skin to the length of about two feet, and which when matured actually makes an orifice in the skin through which it discharges its young.

By these three methods, then, (1) by discharge of young from the skin, (2) in the blood sucked from the skin, and (3) by the passage of the eggs of the parasite in the fluid or solid excrements of the body, the worms endeavour to spread from one human being to another.

These eggs or young forms, as they leave the body of an infected person, are not infective. A period of delay, during which certain advance in development takes place, must now intervene before the stage of infectivity is reached. A knowledge of what takes place during this period of delay outside the body is essential for a proper understanding of the sanitary control for each disease.

Those which leave through the skin are always abstracted by a blood-sucking insect, in the body of which the parasite undergoes development and metamorphosis during a period of five to ten days. At the end of this time the parasite is again able to enter the human being at the moment of biting by the infected insect. The control of these infections, of which the Filarial diseases and notably Elephantiasis are the most important, depends upon a knowledge of the mosquitoes and other biting flies which act as carriers, for if these are eliminated an essential link in the passage from one person to another is broken.

In the case of the Guinea Worm, the young are discharged through the skin into water, but die within a few days unless they are swallowed by certain minute water fleas or crustacea (*cyclops*) in the bodies of which they undergo development, and within the bodies of which they eventually gain access to the human being as contaminations of drinking water.

In those parasites of which the eggs leave the body in the excrement, exposure of the eggs to oxygen, in some cases without the addition of water, in other cases with the addition of water, is essential for further development.

The eggs of Ascaris, of the Whip Worm, and of the Seat Worm, are not infective when passed, but they become infective after remaining outside the body for some days or weeks in only moist situations, for the

embryo is able to develop within the eggshell even under these apparently adverse conditions. These young forms do not hatch, but are taken back into the body, within the original shell, as contaminations of food.

There are certain other eggs, viz., those of the Tapeworm, which after leaving the body do not require water, but they are not infective to Man even after a period of delay unless they are passively taken first into the bodies of food animals, like the Pig and Cattle. In these intermediaries the young develop to a cystic stage, which is then infective to Man when the infected flesh is eaten.

Among those parasites of which the eggs require water for their further development, we find the most important of Tropical forms, e.g., the Hookworms. In these cases the young hatch from the eggshell and become free-living organisms for a brief period. Thereafter these forms can enter the human body by penetrating the skin.

Lastly, we have another group which not only finds water essential for hatching, but thereafter of necessity must enter the body of certain water-inhabiting snails. In the bodies of these snails the young form undergoes enormous multiplication, resulting in thousands of "Cercariæ," or infective bodies, which ultimately swarm out of the snail into the surrounding water. These Cercariæ comprise two groups, viz., those which can at once infect the human body by piercing the skin, e.g., Bilharzia, and those which require to undergo encystment, e.g., the Lung and the Liver flukes. Those forms which undergo encystment eventually enter the body, either as a contamination of water, or incorporated in the tissues of crabs or fresh water fish in which encystment has taken place.

From this brief general summary it is apparent that infection may come from very different directions: (*a*) from oral contamination with stale fæcal matter, (*b*) from contamination of the skin with infected water, (*c*) from the biting of infected insects, and (*d*) from infections hidden within the tissues of food animals.

The lecturer then illustrated the above generalisations by a series of lantern slides, showing the manner in which eggs of the various parasites could be distinguished by microscopical examination of the stool. The different stages of development of the more important worms were traced in the various food animals. The life history of the Hookworm and the educational methods employed in its eradication by the Rockefeller Foundation were demonstrated by a cinema film.

Flies and Mosquitoes, by Lieut.-Colonel H. J. Walton, M.D., F.R.C.S., I.M.S. (retired).

Being résumé of Lecture delivered at the Institute on November 23rd, 1922.

GENERAL characters of flies and mosquitoes, and of the order *Diptera*. Flies may affect man directly, by attacking his person as parasites, or by being the specific and necessary intermediate hosts of certain disease germs; or indirectly, by contaminating human food or drink. In the conditions known as Myiasis, the larvæ, or in some cases the adult flies, may suck blood through punctures in the skin, or may live in the natural cavities of the body, in neglected wounds, in the subcutaneous tissue, or in the alimentary canal. None of these flies are obligatory parasites of man, but attack him as well as domestic or wild animals. General account of the different flies which cause Myiasis. The Diptera which are specific carriers of disease are the mosquitoes, tsetse flies, sand-flies, and some of the gadflies. Life-history and methods of control of the tsetse flies. Geographical distribution, bionomics, fecundity, and control of the house-fly; methods of dealing with its larvæ; its importance in spreading disease. The mosquito; its natural history and habits. The primary divisions of the family *Culicidæ*. The diseases conveyed by mosquitoes; malaria, yellow fever, dengue and filariasis, and possibly some others. Importance of the study of the habits of the different species of mosquitoes in order to control them. The best methods of destroying larvæ and of the prevention of breeding of mosquitoes are permanent ones, such as drainage; this also increases the value of the land for agricultural purposes, and so may pay for its cost. Oil and other larvicides; their uses and limitations.

Experiments Made with Larvivorous Fish in British Honduras, by John H. Peach (Associate).

IN writing this article, one of my main objects is to further the knowledge relating to the destruction of mosquito larvæ, and also to help any of my brother inspectors in solving the problem of larvæ destruction, when cisterns are used for retaining water for domestic supplies. I have in mind British Guiana, Antigua, and some of the other West India Islands.

When I came to British Honduras from Barbadoes in 1921 to take up sanitary work, and especially the destruction of the dreaded *Stegomyia fasciata*, I found that the Rockefeller Foundation had already started a mosquito campaign under Dr. E. I. Vaughn. This operation largely consisted in organizing a staff and making a thorough inspection of the vats, tanks, barrels and other receptacles for holding water, besides oiling pools, etc. As the advent of this expert body was caused through an outbreak of Yellow Fever a few months before my appointment, it was necessary to oil all the tanks and receptacles so as to reduce the prevalence of the stegomyia, and to bring the index down to a safety factor, but in the meantime notices were served to have all receptacles screened. The screening was done in the ordinary way, but it was found that the effect of screening did not last more than five or six months on account of the climatic conditions, and the process had to be renewed.

Surface wells were also a source of trouble and it was necessary to pass a law compelling the owners to properly screen these and provide a pump, or abolish them. It was found difficult to carry out the law on account of the expense and the necessity of these wells. It struck me then that perhaps a local fish could be used in the tanks and wells, and with this view, I started to experiment with the different kinds of small fish of the colony which were said to be larvivorous, namely: the " Billham," = *Tetragonopterus æneus*, Gunth (Characidæ); " Crana," = *Cichlasoma otofasciatum*, Regan (Cichlidæ); " Poopsey," = *Mollienisia sphenops*, Cuv. & Va. (Cypronodontidæ). These were identified for me through the agency of the Director-in-Chief of the Wellcome Bureau of Scientific Research, to whom I am indebted.

My first experiment was carried out with the " Billham " in a glass jar holding about a gallon and a half of water, in which I placed one fish measuring 39 millimetres long and 10 millimetres deep with 22 larvæ, at 4 p.m. By next morning at 7 a.m. all the larvæ had been eaten. The next day 50 larvæ were put in at 8.30 a.m., and by 3 p.m. they were also eaten. My next experiment was with the " Crana," which destroyed 50

larvæ in about four hours. The " Poopsey " was the next used for experiment, and one, 40 millimetres in length and 10 millimetres in depth, was placed in a similar jar with 82 larvæ, and in two hours and forty minutes these were all eaten. The next day 85 more larvæ were put in and were eaten in three hours.

These fish are all fresh water fish, but not being satisfied about their being able to live in rain water in tanks, " The Yellow Fever Executive Commission " decided to obtain three vats holding 700 gallons each and place similar fish in them. This was done and eventually proved that the fish would live enclosed in the tank with little light and no artificial feeding. These vats have now been established for six months, and although examined frequently, no sign of larvæ or even rafts of eggs can be seen. On account of these experiments, the vats of the different Government Institutions have all been " fished " and about two hundred of the private owners have also had fish put into their vats by my Department.

The " Poopsey " are very similar to the " Millions " of Barbadoes and Trinidad, but are not as hardy and cannot stand much handling. They are also viviparous and on two occasions have bred in my vat, the first time producing forty-five young, and on another occasion eight.

The " Crana " reminds me of a fish in British Guiana locally called " Patwa," previously found plentifully in the trenches, which are now filled in and which are used as avenues.

The " Billham " is an extremely voracious fish, and it is said here that while travelling in the forest, should one become infested with ticks, which frequently happens, one only need immerse oneself in any rivulet and these fish quickly remove the ticks.

I find from my experiments that it is not necessary to have more than one or two " Billhams " or " Crana " to a vat of any size, and a similar number of " Poopsey " to a well. All these fish are bought at one cent (halfpenny) each in large numbers and are placed in the vats by the Department when requested by the owners.

In dealing with pools, etc., instead of using oil, I now transfer a few small " Poopsey " from a nearby pond or pool, and until that pond dries up, my troubles as regards mosquito larvæ are over.

Sewage Disposal in British Guiana, by John H. Peach (Associate).

PREVIOUS to 1914, proper Sewage Disposal in the Suburban Districts of British Guiana was looked upon as a non-essential, and although the laws were on the statute book requiring owners or occupiers to provide pit latrines, this law we kept in abeyance and it was optional for owners to provide latrine accommodation for themselves or their tenants.

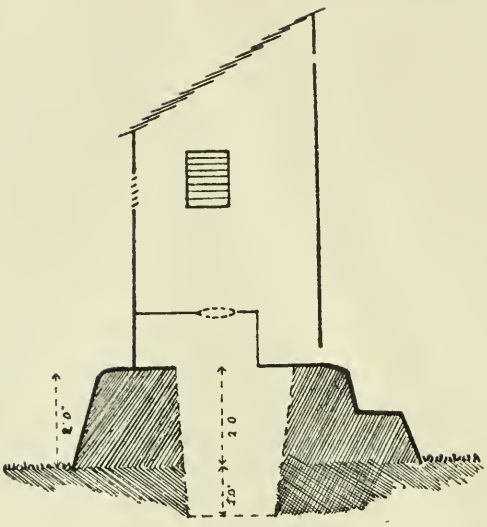
At about this time a Government Public Health Department was formed and eventually Dr. E. P. Minett was placed at the head, and a qualified Sanitary Inspector was brought out from England (Mr. D. J. Bell).

The type of latrines in use at this time was just an ordinary pit dug in the ground, and a structure put over it for the sake of privacy, but, as the excavation accumulated water from the subsoil during the rains and could under no condition be called sanitary, and as something had to be provided for the collection and disposal of excreta, the Government Medical Officer of Health and the Sanitary Inspector experimented and eventually designed a pit which could be used without a disgusting odour arising and with no accumulation of subsoil water, even in the wet weather. This pit was built as follows: A hole was dug and the earth that was removed from it was banked on the surface at the spot where it was decided to put the latrine. This bank was made about five feet by five feet by two feet high and well rammed. A hole was then dug through this mound about two and a half feet square and three feet deep. This was a size which suited the average household of the village, and from experience could be used for about six months.

After it had become filled, the problem was how to dispose of the excreta so as to avoid going to the expense of building another latrine or pit, an expense which few of the villagers could bear, although the cost was not much, not more than ten shillings. It was then decided to advise the people to sink another hole or trench at the back or side of the latrine and cause the contents to be emptied into this hole and covered after throwing some temper lime or a pint or two of crude petroleum over the contents.

It will be readily understood that by this method of using the ground at the sides and back, there would be an interval of eighteen months before the first pit or trench in which the excreta accumulated was required. These latrines had crude oil placed over their contents so as to prevent the breeding of flies and were undoubtedly a success.

I personally have used them when working as an assistant Government Sanitary Inspector under the above-named gentleman, and remarked on the absence of any odour. I think this type an ideal latrine for those



Section of Pit Latrine used in the Country Districts of British Guiana.

villages that cannot afford a proper system of Sewage Disposal, and where the subsoil water is close to the surface.

Preventive Medicine in Australia, by W. G. Armstrong, M.B., Ch.M. (Syd.), D.P.H. (Cambridge), Director-General of Public Health, New South Wales (Fellow).

Being Presidential Address delivered at the Annual Conference of the Health Association of Australasia, Sydney, October, 1922.

Sanitation and the Prevention of Infectious Disease.

Twenty-five years ago the whole programme of Public Health as taught in the universities and set forth in the standard text books of the day included very little more than what we now ordinarily speak of as "sanitation," together with the prevention of the infectious diseases. "Sanitation" might be defined as the ordinary conditions of environment of the civilised individual and as being concerned with such questions as housing, water supply, sewerage, removal of refuse and the prevention of food adulteration. It is with such matters only that the English Public Health Act of 1875 concerned itself, and it was upon that Act that all our Australian systems of preventive medicine and public health legislation were based.

In general terms the care of the public health in the Australian States is vested in local authorities who execute the public health acts under the control and supervision of a central authority in each State. Within municipalities the Municipal Council and within shires the Shire Council is the local authority.

The constitution of the central controlling authority is not the same in all the States. In some the powers and duties of control are exercised by a Central Board or Commission of Health consisting partly of prominent medical practitioners and partly of laymen. In others the powers of central control are vested in a Chief Health Officer or Commissioner who is appointed and paid by the Government and must be a medical practitioner. In every State there is also a Ministerial Head, known as the Minister of Public Health, who occupies a seat in the Cabinet and is responsible to Parliament for his Department.

Each of the States possesses as the basis of its public health machine a Public Health Act framed more or less roughly upon the model of the English Public Health Act of 1875, but varying widely from the model in many directions to meet the special needs of a young and sparsely populated country. Many useful provisions for the control and safeguarding of the public health are, however, to be found in legislative enactments outside the Health Acts. There is a strong tendency throughout Australia to control sanitation by means of by-laws and regulations which, owing to

their flexibility, are specially adapted for this purpose. Comparing the public health legislation of the different Australian States, it will be found that that of New South Wales is on the whole the most conservative in type and the most cumbrous to administer, the latter fact owing in part to its being scattered among many different Acts of Parliament which in other States have been consolidated with the Public Health Act.

The executive personnel employed in the public health services in Australia consist of (1) Medical Officers of Health and (2) Health Inspectors. The exact titular designations of these officers vary slightly in the different States, but the duties discharged by them are best indicated by the titles given. The position of Medical Officer of Health differs in New South Wales from the same position in the other Australian States. In five of the six States these officers are appointed and paid by the several local authorities and consist of medical practitioners in private practice in the district, usually having no expert acquaintance with or training in the problems relating to public health, and in receipt of salaries which range from £25 a year upwards. In New South Wales local authorities cannot appoint medical officers of health, but these officers are appointed by the Government to populous groups of districts. They devote the whole of their time to their duties, and are sanitary experts. In the beginning it was intended that all the more thickly settled districts of the State should be provided with these officers, but this ideal is still unfulfilled and only three have so far been appointed to the most populous areas. The rest of the State relies for expert advice in public health matters upon the professional staff of the Central Department of Public Health, the medical officers of which visit country towns when required.

Local Authorities in all the States appoint health inspectors, and in the more important municipalities there is an increasing tendency to demand some qualification for his duties on the part of the officer they appoint. The possession of a diploma of Sanitary Inspector of the Royal Sanitary Institute (London) is a qualification much sought after in this connection. Already nearly 400 health inspectors in Australia possess this qualification, conferred on them, after training and examination, by the local committees of the Institute, which have been established in all the Australian States.

In this State we have in the Sydney Technical College an institution which has made provision for the entire training of these officers in a very efficient manner. The time is probably not far distant when an Australian Institute will be established, with branches in all the States, to examine candidates and grant diplomas on lines somewhat similar to those of the Royal Sanitary Institute. Such a body should be Australian in scope and not confined to an individual State.

The control of the more common infectious diseases is remitted to local authorities in all the States. Notification of cases must be made to the local authorities and by them transmitted to the Central Authority. The list of notifiable diseases is not the same in all the States, but in every State such diseases as diphtheria, typhoid fever, scarlet fever, infantile paralysis, cerebro-spinal fever, and pulmonary tuberculosis are notifiable. Most of the States differentiate between the commoner infectious diseases and those of a more serious and exotic nature. The latter are classed as dangerous infectious diseases and include smallpox, cholera, yellow fever, and bubonic plague. The control of this class is retained by the Central Authority. Disinfection of infected dwellings and goods is performed by local authorities in the case of the ordinary infectious diseases, and by the Central Authority in the case of the dangerous infectious diseases. Children from infected houses must not attend school and sufferers must not visit public places nor travel in public conveyances to the risk of the public.

One of the recent developments of sanitary science has been the discovery that certain persons, though not themselves suffering from any symptoms of an infectious disease, may nevertheless carry the germs of such a disease on or in their persons and may infect other persons with whom they come in contact with the disease in a virulent form. Such individuals are known as " Carriers " and under certain circumstances they may become very dangerous to the public. " Carriers " of typhoid fever, diphtheria and cerebro-spinal meningitis are known to be not uncommon. Several of the Australian States have enacted legislation providing for the examination, suitable isolation and treatment of such " carriers " with the object of minimising the risk of their infecting other persons.

Vaccination is legally compulsory in all the Australian States except New South Wales, though in most of the States it is enforced more or less leniently. In New South Wales there is no law requiring vaccination, and in this connection it is interesting to note that in 1913 an extraordinarily mild strain of smallpox was introduced into New South Wales from Canada. It was rarely fatal. Among the 2,000 cases which were known to have occurred, there were but four deaths.

The more virulent type of smallpox has invaded Australia on many occasions, but the energetic measures of isolation and vaccination adopted were always successful in limiting these invasions rapidly.

Bubonic plague has invaded Australia on two separate occasions. The first one was in the year 1900, and the disease was not finally got rid of till nine years later. The second invasion was last year. The brunt of both invasions was borne by the north-eastern States of Queensland and

New South Wales. The other States either escaped entirely or only had a few cases. The reasons for this relative or complete immunity of the more southern States are probably to be sought in the distribution of the Indian rat flea, which is very susceptible to climatic influences and seems to be relatively rare in those States. This flea conveys plague from the rat to man.

Dengue, malaria and filarial disease are not uncommon in Queensland, and the first named has on occasions visited the extreme north coastal districts of New South Wales. These diseases are all transmitted by the bites of different varieties of mosquitoes, and the localised prevalence of the diseases is closely related to the geographical distribution of the mosquitoes implicated. Repressive measures against mosquitoes and the exclusion of the insects from dwellings by wire gauze are relied on to check these diseases.

Australia is justly proud of its pure food legislation. It is probably the most advanced in the world and it is enforced with considerable thoroughness in all the States. Adulteration or any sophistication of food, fraudulent or misleading labelling, unclean or dangerous methods of preparation are visited with severe penalties. Standards have been set up for most of the commoner articles of food and no departure is allowed from them. Pure food legislation in all the States is on lines of very close uniformity and is largely carried out by means of regulations.

During the past week a conference of representatives from the Health Departments of all the Australian States has been held in Sydney to endeavour to eliminate the few remaining differences in standards and labelling regulations in the State codes. It has been very successful and its conclusions when given effect will facilitate interstate trade.

The special problems of the conveyance of disease to human beings by means of infected meat and milk are met and combated in all the Australian States by elaborate regulations for the control of slaughterhouses and dairies and the maintenance of trained staffs of inspectors in relation to both these activities. Though it is true that the regulations controlling the milk supply have been gradually " tightened up " very considerably during the past twenty years and adulteration has diminished correspondingly, it is still a fact that far too much dirty milk is sold and it has become a question whether a bacterial standard of purity should not be set up and enforced. As far as tuberculous milk is concerned, investigations now being carried out in the Biological Laboratory of the New South Wales Health Department tend to indicate that tubercle is very rare in Sydney milk. They are, however, not yet complete.

The installation of public water supplies is making steady progress in

Australia, and all the capital cities and many of the larger country towns have long been provided with this inestimable adjunct of communal life. In the smaller towns and isolated dwellings, water collected from the almost universal iron roof and stored in iron tanks is the general source of supply.

Excellent sewerage systems are found in the capital cities and a few of the larger country towns, but in most of the country towns conservancy methods of dealing with excremental waste are employed. However well these methods are controlled, they are never so healthy as those which depend on sewers. Typhoid fever and other bowel complaints are always more prevalent in unsewered towns than in those which possess sewerage systems.

The disposal of dirty house water or "sullage" water, a simple enough matter in sewered towns, becomes a very difficult problem in communities which have no sewer facilities. If the soil is absorbent in character, dwellings surrounded by small allotments of land can generally dispose of their sullage water by subsoil irrigation. If the contour of the ground on which the town is situated is undulating, local authorities sometimes wink at the practice of discharging sullage water into the street gutters, though this is generally prohibited.

The dry refuse of houses, generally known as garbage, is, in nearly all Australian communities, collected by the local authorities and buried in waste ground outside the populous localities. The capital cities of most of the States and a very few of the larger country towns have established incinerators for disposing of this class of refuse by combustion, and this method of treating such waste material is slowly spreading.

The housing question in this country has not the same overwhelming importance as in Europe. The mildness of the climate and the greater amount of sunshine are more favourable to an open air life. There is less grinding poverty here, and poverty is after all the main reason for bad housing. Nevertheless there is far too much overcrowding in some of our older cities, particularly in the industrial districts. Few local authorities properly realise their duties or the large powers they possess under the Health Acts for enforcing proper sanitation in and about the dwelling. Of all the Australian capital cities, Sydney is perhaps the most backward in this matter, partly, no doubt, because it is the oldest and the largest of Australian cities and was never properly laid out from the beginning. It is of interest in this connection to mention that within the past few months a very comprehensive and up-to-date code of building regulations has been framed by the New South Wales Local Government Department and applies to all towns throughout the State, except the City of Sydney, which has its own Regulations.

The prevention of nuisances, including the control of noxious trades, is everywhere one of the important duties of the local authorities, and in all the States, regulations dealing with matters which come under this category are numerous, and have for their object the protection of the public from the production of nuisances dangerous to health or offensive to the sense of smell.

Infant Welfare and the Reduction of Infant Mortality.

The death rate of infants is the most sensitive index we possess of the physical welfare of a nation or a city and of the effects of sanitary government. The cities of Australasia may be proud of the fact that they have the lowest infantile mortality rates in the world. This was not always the case. As late as the year 1885, in Sydney at all events (and, I believe, in the other capital cities of Australasia) the infant mortality rate was higher than in London and as high as in most of the world's great cities, and it is only since that year, and more especially since the beginning of this century, that the great improvement has taken place.

It is a remarkable fact that however great may be the degree of poverty and degradation of the parents, the great majority of children (nearly 80 per cent.) are born healthy. The English Inter-Departmental Committee on Physical Degeneration found that by virtue of some " mysterious law of transmitted impulse the unborn child fights strenuously for its own health at the expense of the mother and arrives in the world with a full chance of living a normal physical existence." Infantile mortality, then, may be considered as largely the capitulation of the young and delicate organism to the adverse conditions into which it is born, and these adverse conditions are mainly those of faulty feeding and maternal mismanagement due to ignorance.

The first organised efforts towards the reduction of infant mortality took place in France and were, perhaps, suggested by the observation that during the siege of Paris by the Prussians in 1871, though the general death rate became extraordinarily high owing to the privations suffered by the besieged, the infant mortality, on the contrary, declined markedly. This phenomenon was generally attributed to the fact that no cow's milk or other suitable food was available for the babies, and the mothers were compelled to nurse them. In 1892 Professor Budin established his infant consultations in Paris. Breast feeding was encouraged, and in cases where this was found to be impossible sterilised milk was supplied at cost price. In England the new movement took the form of the establishment through the country of infant milk depots, most of which, however, have since been closed as failures or have become depots for the sale of dried milk.

I believe that Sydney was the first Australian city to adopt definite measures for the reduction of infant mortality. This was early in the year 1904. The measures relied on were first purely educational and consisted in the appointment of trained nurse inspectors as infant visitors. These officers visited new born children, advised the mothers and advocated, above all, the overwhelming importance of breast feeding. The campaign was so successful that in eight years the proportion of wholly breast fed children had increased from 72 per cent. to 82 per cent., and the infant mortality rate fell year by year. Three years later New Zealand took up the running by the foundation of the Plunket Society for the Health of Women and Children. The Society did excellent work and New Zealand rapidly advanced in this particular field of Preventive Medicine. In 1914 the Sydney staff of " infant visitors " expanded into the establishment of the Baby Clinics which are now rapidly permeating not only Sydney but N.S.W. The neighbouring State of Victoria followed suit in 1917, and at the present time most of the Australian States are possessed of similar organisations.

It must be confessed that we in Australia are still toiling some way behind New Zealand in the race for the reduction of infant mortality rates. It is only fair to observe, however, that the island climate of New Zealand with its frequent rainfall, more equable temperatures, and its smaller cities, is much more favourable to infant life than the continental climate of Australia with its long droughts, hot summers, sudden changes in temperature, and overgrown cities. Infant mortality was never so high in New Zealand as here, and the Australian reduction from a mean infantile mortality rate of 110.3 per 1,000 births in the year 1900 to 63.8 per 1,000 in the years 1917-21 compares quite favourably with the New Zealand reduction from 78.7 per 1,000 in the year 1900 to 48.1 per 1,000 in the years 1917-21. During the last twenty years infant mortality has fallen 42 per cent. in Australia and 39 per cent. in New Zealand. So let us not be discouraged.

I believe there is no division of Preventive Medicine in which so much can be accomplished by propaganda work such as teaching and lecturing as in that of Infant Welfare. And if one were asked what is the most important thing to teach, one should reply " Breast feeding, and next to that Mothercraft in general." This teaching of mothers, and particularly the young mothers, is pre-eminently the duty of baby clinics.

Other appropriate measures of prevention include improvement in general sanitary surroundings, and particularly the milk supply of cities, domestic and municipal cleanliness, and effective control of midwifery. The improvement of the milk supply is a most important measure,

If a baby must be fed artificially on cow's milk (and that is a rare circumstance) the milk should be the best and purest obtainable. The public milk supplies of all the Australian cities stand in need of improvement. The City of Wellington in New Zealand has lately introduced a new system of control. It has municipalised the whole of its milk supply. Time will prove or disprove the wisdom of this.

It is a remarkable fact that in spite of the vigorous efforts which during the past twenty years have been made in most civilised countries to lower the infant mortality, and the signal success which has often been achieved, these efforts have everywhere failed to lower appreciably the mortality of infants in the first month of life. The reason for this is that the majority of deaths during the first month of life are due to developmental conditions. "Of most of these developmental conditions," as Dr. Brend says, "we do not know the cause and we do not know how to prevent the mortality." We hope for further light from the young science of eugenics.

Maternity.

Maternal deaths, 1920: England, 1 in 230 births; Australia, 1 in 199; N.S.W., 1 in 163; N. Zealand, 1 in 154.

Closely allied to the welfare of the infant is that of the mother. The average number of mothers dying annually from causes connected with child birth is rather high in Australasia compared with some other countries, and both New Zealand and New South Wales occupy an unfavourable position among Australasian States. I do not know why this should be the case in New Zealand, but as regards New South Wales it is impossible to rid oneself of the feeling that this state of affairs is in some degree due to the want of control over midwives. Several of the Australian States possess machinery for the registration of practitioners of this profession, and for the exercise of some control over their conduct. Victoria is probably ahead of all the States in this respect. In New South Wales we have nothing of the sort and any woman, however untrained and ignorant, may take up this calling and may assume the title of nurse without incurring a legal penalty. It would probably not be overstraining the truth to say that outside the domain of the private hospitals very few of the maternity nurses practising in country districts have been sufficiently trained to do justice to the heavy responsibilities which they assume, and even in the capital cities of Australia there are too many of the untrained in practice. Nor can the medical profession itself be held free from blame. There is a very general impression that the teaching of obstetrics in Australian Universities is inadequate to the vital importance of the subject; that both clinical and systematic instruction are insufficiently catered for,

and that many medical men pass into practice indifferently equipped to meet the responsibilities and emergencies which inevitably await them in obstetric practice.

Hospital accommodation for maternity cases, both in the capitals and in country towns, should be increased. A portion at least of the sums expended in the indiscriminate distribution of the baby bonus could be diverted towards the establishment and maintenance of this class of hospital, or to such a maternity benefit as the provision of domestic aid to necessitous women during and after the time of child birth. It should be one of the duties of the State to ensure that it shall be possible for every woman to receive proper and adequate attention before, during and after childbirth. A few country hospitals have made the necessary provision for treating maternity cases, but the majority are without such facilities, and prospective mothers in isolated farms and small homesteads in the bush who wish to escape the undesirable conditions which face them in child birth should be able to get to a hospital with proper provision and staffing. At the present time the private maternity hospitals which are found in most country towns usually represent the only provision for this class of cases. Though they have temporarily filled the gap and, on the whole, with credit to themselves, there is need in the country as in the cities for both the private and the public maternity hospital.

The School Child.

Every State in Australia has made more or less complete provision for the medical supervision of the school child, but only in Tasmania and New South Wales is the medical examination of school children general and universal. The credit of being the first State in the Commonwealth to provide for the systematic medical examination of school children belongs to Tasmania, which initiated this important work in 1906, and under the scheme in force there all the primary school children come under medical observation at least once in every two years. The work now being carried on by the school medical branch in New South Wales embraces the following activities:—

(1) The medical inspection of all school children in the State; (2) The investigation of epidemics of infectious disease affecting school children; (3) Delivering systematic courses of lectures at the training college on medical subjects; (4) Giving treatment in the back country schools to cases of ophthalmia in school children; (5) Visitation by nurses to the parents of defective children to secure the proper treatment of such children; (6) Propaganda work in hygiene by the issue of books, pamphlets and periodicals; (7) Dental treatment.

A travelling hospital and travelling dental clinics have been established

and work in those parts of the State where there are no resident doctors or dentists. Though such a comprehensive programme as that indicated is in operation in few of the other States, it is being approximated to in most of them. In all the States the common cup and the common towel, those two frequent carriers of infection, have been got rid of.

So much to the good. Unfortunately it cannot be said that everything is lovely in the school garden. The teaching of mothercraft to the older girls is, I regret to say, rather neglected in all the States. Open air schools do not exist—a most surprising statement to make of a country with the Australian climate. There is a very general lack of sufficient playground space in cities and towns, and many school buildings are overcrowded, badly constructed and badly lighted. The physical training of the children should have more attention, especially now that the Commonwealth is relaxing the military cadet system. Finally, provision should be made for the treatment of minor defective conditions in school children at out-patient clinics at country hospitals. Such provision is almost totally wanting at present, and its absence hampers considerably the work of the school medical departments.

Industrial Hygiene.

Every trade and industry is accompanied by its own special risks to the life and health of the employees therein, and the objects of industrial hygiene are to ascertain those risks and, as far as possible, eliminate them. If they cannot be eliminated, they should at least be minimised. To a certain limited extent this has been recognised in Australia, and all the States have long possessed legislation providing for factory inspection and regulating ventilation, illumination, the employment of young persons, and some other cognate matters.

Research in Preventive Medicine.

No State with a proper sense of its duty to its citizens can afford to neglect Research in Preventive Medicine. The new medicine depends more and more upon the laboratory for diagnosis and treatment. 'In a country like Australia the division of duties between Commonwealth and individual States in this matter seems obvious. The Commonwealth should be prepared to manufacture on a large scale sera, vaccines and similar preparations, and to supply them to the States as well as to standardise all imported preparations. The States should maintain central biological and chemical laboratories where analyses and examinations of water, milk, sputum, blood and pathological secretions can be made for hospitals, for medical practitioners on behalf of their poorer patients, and in connection with special investigations. Both Commonwealth and State

laboratories should also carry on research on all questions relating to the public health.

At the present time only three of the Australian States have biological laboratories in connection with their public health departments. The other States get their bacteriological work done for them by arrangement with a university or hospital laboratory. None of the States possesses either the subsidiary or the mobile laboratories which I have referred to.

The Commonwealth serum laboratories in Victoria manufacture sera and vaccines on a large scale and supply them to medical practitioners and others throughout Australia. The Australian Institute of Tropical Medicine in North Queensland concerns itself chiefly with research into important questions of tropical hygiene. Many of its published investigations have proved of the greatest interest and value to Australia in general and to the public health services in particular. Nor have we in New South Wales any reason to be ashamed of the results achieved by our own public health laboratory in the field of original research. In this connection one need only refer to the investigational work done in reference to the first outbreak of plague and that undertaken in relation to dengue fever which finally determined the particular variety of mosquito responsible for the transmission of that disease.

A field which offers special inducements for research work in Preventive Medicine to-day is the prevention of diphtheria. It is now known that all children are not liable to contract diphtheria. Some are naturally immune. The proportion of children who are susceptible varies from 70 per cent. at one year old to 25 per cent. at ten years old, and a still smaller proportion at later ages. Some years ago a simple test was discovered which on being applied to any child will indicate whether he or she is susceptible to diphtheria. If the result is positive the child can be made immune by the inoculation of diphtheria toxin-antitoxin, and this immunity lasts for many years. Very satisfactory reports are now being received from America of the practical value of this method and its protective effect upon children. If the American results can be repeated here, there appears to be good grounds for hoping that at no distant date diphtheria will be robbed of all its terrors.

The Treatment of Infectious and Non-Infectious Disease.

The principal factor in the treatment of disease is the hospital. Speaking generally, Australia is well supplied with public hospitals, better than Great Britain or France. With regard to general hospitals, the latest available returns show that the proportion of hospital beds to population for the whole of Australia is equal to 3.2 per 1,000 persons. The State of

West Australia has the largest number of beds, namely, 5 per 1,000, and Victoria the smallest, 2.3 per 1,000. New South Wales holds an intermediate position with 3.2 beds per 1,000. The latest English figures indicate for the whole of the British Isles 1.3 hospital beds per 1,000 persons, while the figure for London is a good deal higher, reaching 2.9 per 1,000. The number of beds provided by Australian hospitals appears to be, except in time of special stress, sufficient for the present needs of the population. Speaking of New South Wales, which is the only State of which I have full data on this matter, the average daily number of beds occupied during the year 1921 in Sydney hospitals was 76 per cent. of the beds available, while in country hospitals the average daily number occupied was 63 per cent.

Provision for infectious cases is made both in the State capitals and the country districts. Each of the former has its infectious disease hospital, and in the country most of the hospitals are provided with infectious disease wards or annexes.

In several of the States, Bush Nursing Associations have been formed to provide nurses for isolated districts without a doctor or a hospital. These associations are partly maintained by aid of Government subsidies, and they perform a very valuable work in providing nursing assistance in small and scattered communities where it would not otherwise be obtainable.

The hospital system in Australia suffers badly from lack of organisation. The State Governments defray about half the expenditure on the hospitals, and yet they retain very little effective control over the institutions, the affairs of which are managed by boards or committees elected in most of the States on a rather illogical suffrage. Owing to the enthusiasm of the residents and to the employment of political influence, it has not infrequently happened that hospitals have been erected in districts where there was no real need for them, while in other districts there is a shortage of hospital accommodation. In all the States there should be more system introduced, and the Central Authorities should exercise powers at least equivalent to the proportion they contribute to the building and maintenance of the hospitals. The motor ambulance has enormously increased the radius of effective hospital service wherever the roads are moderately good, and more use should be made of these vehicles in the country districts.

One cannot leave the subject of national treatment of disease without referring to the campaign against hookworm now proceeding in Queensland and the north coast of this State. The Rockefeller International Health Board, the Commonwealth and the affected States have combined

in this campaign under Commonwealth co-ordination and under the direction of medical experts lent by the Rockefeller Institute. Cases of the disease are being ferreted out in the districts affected and great numbers of persons have already been cured. It is to be hoped the work will be carried to finality and Australia freed from this distressing complaint.

Casting one's glance back over the past 35 years and comparing the period 1885-90 with the last five years, one is able to appreciate the surprising advance which has been made in certain directions. It has been most marked in general sanitary environment and in the reduction of the burden of infectious diseases. In that period the general death rate of Australia has fallen 27 per cent., from 14.8 per 1,000 of the population to 10.8 per 1,000. This means a saving in our present population of 22,000 lives every year. The mortality from consumption has diminished by one-half, from 12 per ten thousand of the population to 6 per ten thousand to-day. The death rate from diphtheria and croup has decreased 72 per cent., and the typhoid fever death rate shows the almost incredible fall of 87 per cent. and appears to be a rapidly vanishing quantity. The infant mortality during the same period has fallen 50 per cent., and in the great cities where the bulk of the improvement has taken place, the fall has been very much greater, reaching 70 per cent. in Sydney.

Unhappily a similar improvement is not evident in some other directions. Measles is still prevalent and causes a heavy mortality. The same may be said of influenza and pneumonia, and cancer appears to be slightly increasing. Venereal disease is to-day one of the greatest problems in the realm of public health and causes much mortality and still more disablement and misery. The effect of the recent legislation against it in the Australian States is not yet apparent.

———

OBITUARY.

THE RIGHT HON. THE EARL OF PLYMOUTH, G.B.E., C.B.

The Institute lost a staunch supporter by the death of Earl Plymouth on March 8th. He was always ready to help in any good cause and was President of the Congress at Cardiff in 1908 and joined the Institute in that year, becoming Vice-President in 1910 and President in 1913, and continuing in that office till 1921. Ill-health after the war prevented him from taking a more active part than he did in the affairs of the Institute, but so far as possible he attended and presided at its meetings. He was of a retiring disposition, largely interested in art and in works mainly for the benefit and improvement of the people. His work perhaps was more particularly apparent in S. Wales, where he possessed considerable property in Glamorganshire and had large interests in coal mines and the Docks at Barry, and during the Congress at Cardiff entertained the members at his residence, St. Fagans. He was appointed First Commissioner of Works in 1902 and held that post for three years, and no doubt found its duties very congenial to his tastes, although the period was perhaps too short to enable him to impress his wishes on that Department, but the Victoria Memorial was being considered at that time and afforded him some opportunity for the exercise of his artistic tastes. His great public spirit was shown in his efforts to acquire the Crystal Palace for the nation, for which he provided the necessary financial assistance and ultimately contributed some thirty-five thousand pounds to the cost.

His death will be regretted by a large circle of friends who knew him and liked him for his great charm and unassuming manners. H. T.

It is with regret that the Council have to record the death of the following Members and Associate:—

Members.—H. E. Anderson, the Borough Engineer of Lambeth, who had been for over 20 years a Member of the Institute.

Herbert Markant Page, M.D., D.P.H., M.R.C.S., who joined the Sanitary Institute of Great Britain in 1881 and was a Life Member of the Royal Sanitary Institute. He was for very many years an enthusiastic Public Health worker, being Medical Officer of Health at Redditch and afterwards at Langport, and he took a great interest in the Institute's work.

William Lamb White, head of a firm of Heating, Lighting and Domestic Engineers of Birmingham. He passed the Institute's Examination in 1893, became an Associate in 1898, and was elected a Member in 1920.

Associate.—Joseph Crathorn, the Sanitary Inspector of Paignton for 28 years, who had been an Associate since 1894. He was a Past President of the Western Centre of the Sanitary Inspectors Association, and was much respected in the town, for which he had laboured so long.

THE ROYAL SANITARY INSTITUTE.

FOUNDED 1876.

REVIEWS OF BOOKS.

MODERN BUILDING, Volume IV.

Edited by H. D. Searles-Wood, F.R.I.B.A., and Henry Adams, M.Inst.C.E. 4to., 166 pp., illustrated. London, 1921. The Gresham Publishing Co., Ltd. Price 15s.

This volume explains those subjects which, whilst not necessary in most cases for town buildings, are absolutely essential for buildings in Rural or Country areas. The same principle is adopted as in the other volumes, viz., separate sections are written by well-known authorities, including Messrs. Henry Adams, A. J. Martin, Walter Jazzard, H. D. Searles-Wood, and Richard H. Bew.

Some useful tables which are seldom found in Building Construction Books are given on pages 12 to 15, but some of the syphon traps are obtained from old pattern blocks; the general scheme of drainage as set out is, however, absolutely modern, and the chapters on Sewage Disposal are essential for any Designer whose practice lies in the direction of Country Mansions, Factories, or similar works, the treatment of sewage being briefly, but fully, dealt with by the author, who concludes with an explanatory diagram of a pneumatic ejector.

There is nothing particularly new in the chapters on the sanitary inspection of houses or shoring of buildings, but the diagrams in the latter article are very instructive. The volume concludes with chapters on earth walling, pise de terre, etc., and levelling instruments. E. W.

Volume V.

4to., 164 pp., illustrated. Price 15s.

This volume includes under one cover the best brief compilation on the design of factories, workshops, hospitals, and sanatoria; small gas and electric light installations, and reinforced concrete design.

It will be appreciated these subjects are still more or less in a state of evolution, but the latest general and scientific information is given in concise form.

The work can be read with interest by the student and the practising architect, and it will be found both interesting and instructive. It is one which no architect or surveyor's library should fail to include. E. W.

A Little Book on Water Supply.

By William Garnett, M.A., D.C.L. 8vo., 144 pp., illustrated. Cambridge, 1922. The University Press. Price 6s. 6d.

While there is readable matter, of historical character, in this book, it does not commend itself as being one for the use of non-technical students, or of teachers who desire to impart to them some general knowledge of water supply.

The subject is not presented with sufficient simplicity, far too much space being taken up with details of a purely technical character, fit enough for advanced students, but entirely " over the heads " of those for whom this book is professedly written. There is a confusing lack of sequence throughout, as though the notes, from which the book was compiled, had been indiscriminately mixed up, and presented in haphazard order, and without regard to the relative importance of the matter. As an instance, a long description of the water supply of Jerusalem occupies six and a half pages, while that of Glasgow is dismissed in a few lines; and again, there is a lot about Alpine water partings and next to nothing about those in this country.

A great deal of space is devoted to abstruse and highly technical subjects, such as Bacteria, the Cyclone, Water contours, the Law of Underground Water, the London Water Acts, the Pressure on Dams, and the Hydraulic Accumulator (which is not employed in connection with water supply), fit only for presentation in a wholly technical work.

To be of any real general educational value a book of this kind should be written by someone having practical experience in the design and administration of waterworks, be concise, and the subject matter marshalled in such well ordered sequence as to lead the reader, step by step, from the sources of supply to where the water is consumed.

The historical matter contained in the book is of great interest, and it is to be regretted that the author did not confine his efforts to its presentation. W. M.

Industrial Hygiene and Medicine.

By E. W. Hope, O.B.E., M.D., D.Sc., W. Hanna, M.A., M.D., D.P.H., and C. O. Stallybrass, M.D., D.P.H. 8vo., 766 pp., illustrated. London, 1923. Baïlliere, Tindall & Cox. Price 25s.

The steadily increasing number of persons who are interesting themselves in the science of industrial medicine will welcome the appearance of this text book. It summarises information regarding all branches of a large subject upon which much work has been done in recent years. The authors have laid these recent investigations under requisition, fitting each piece of new knowledge into its place and presenting a useful picture of the whole. Each chapter contains a valuable and up-to-date bibliography of the matter discussed. Perusal of the book brings out clearly the advances which have been taking place; with regard to ventilation due to the introduction of the kata thermometer; with regard to illumination following

upon the work of the Departmental Committee on lighting in factories; with regard to the occurrence of phthisis in industry due to recognition of the toxic nature of silica dust; to human activity due to the investigations of the Industrial Fatigue Research Board; to general welfare and conditions of work due to the publications of the Health of Munition Workers' Committee, and to action taken by the Home Office; to accident prevention due to the first aid movement.

Regret may be expressed that when dealing with lead poisoning, absorption through the digestive tract is mentioned first as a channel of entry, while Legge's pronouncement that lead dust and fumes alone are the causative agents is relegated to a footnote. And yet the great reduction in cases from 1,058 in 1900 to 230 in 1921 (during which period, owing to expansion in trade, the number exposed to risk was steadily increasing) was brought about by action based on Legge's dictum.

The section dealing with dust estimations describes apparatus invented in America and in South Africa, but suffers from lack of reference to Owens' Dust-counter, which is probably the best yet devised and has the advantage of being a home product. Nevertheless, the discussion on dust as a cause of disease is one of the best parts of the books, even though, by a chance of classification, tuberculous silicosis is again dealt with under the heading of industrial infections. A similar chance causes rescue work and gassing by carbon monoxide in mines to be dealt with twice; in a book wherein so much, of necessity, had to be sacrificed in the interests of space, such double references might have been advantageously avoided. The subject of industrial activity and fatigue is so condensed that it hardly does full justice to recent work, the greater part of which has been carried out in this country; somewhat curiously in the same chapter we find grouped occupational neuroses.

The volume certainly suffers from condensation due to the necessity placed upon themselves by the authors of undertaking the task of dealing with so much in one book; the wonder is that they have found it in any way possible and acquired the success they have. It contains illustrations for the most part clear and informative which may be useful to those unfamiliar with industries. Essentially the work is a text book for students, and as such may be safely recommended. E. L. C.

Nature and Nurture of Life.

By Courtney C. Weeks, M.R.C.S., L.R.C.P. 8vo., 96 pp. London, 1921. Charles & Son. Price 2s. 0d.

This brief work deals with life from its earliest form of protoplasm. It is interesting reading to the persons for whom it is written, its object being to indicate the disadvantages of alcoholism.

The concluding chapter, entitled "Alcohol and the Natural Life," includes quotations by Sir George Newman, and it undoubtedly emphasises the advantages of temperance.

To the layman it will while away a few hours and give him an elementary knowledge of life and reproducive forces. E. W.

The School of Hygiene and Public Health.

John Hopkins University: Collected Papers, Vol. III., 1921-22. 8vo., 357 pp., illustrated, 1922. Baltimore, U.S.A.

This volume contains 72 papers by various authors who are experts in their several subjects. Sixteen of the papers are devoted to studies on experimental rickets, including two on the prevention of the development of rickets in rats by sunlight, and one on the prevention of rickets in rats by radiation with the mercury vapour quartz lamp. Ten papers are concerned with investigations on the control of hookworm disease. The remaining papers describe original observations on trypanosomes, intestinal amœbœ, and other protozoan infections, or are concerned with the elucidation of various problems in the recording of vital statistics, or with physiological studies in relation to hygiene. L. C. P.

The British Association for the Advancement of Science: A Retrospect, 1831-1921.

By O. J. R. Howarth, O.B.E., M.A., Secretary. 8vo., 318 pp. London, 1922. The Association. Price 7s. 6d.

To those who have been associated with any branch of science during the past fifty years the " Retrospect " is an interesting reminder of the prominent subjects and problems that have come under discussion, and also the many strong personalities who have been leaders in the work of the British Association. Although there is no specific section devoted to Hygiene, it is not outside the cognisance of the Association, and grants have been made from their funds for such subjects as Conditions of Health essential for carrying on the work of instruction in schools.

MEETINGS HELD.

Sessional Meeting.

Sheffield.—The meeting was held in the Town Hall on Friday, March 2nd, when discussions on " Extraneous Matters in Food " and " The Prevention of Disease by Feeding " were opened by C. W. Hutt, M.A., M.D., D.P.H., and Prof. E. Mellanby, M.A., M.D. The chair was taken by Louis C. Parkes, M.D., D.P.H., Chairman of Council. The members were received and entertained to tea by the Lord Mayor.

On Saturday, March 3rd, visits were made to the works of Messrs. Newton, Chambers & Co., at Thorncliffe, when the members were entertained to lunch, and to the Corporation Sewage Works.

Examinations.

Since the last meeting the following examinations have been reported :—

Adelaide, S.A., December 7th and 8th, 1922.
Brisbane, Queensland, December 13th and 14th, 1922.
Plymouth, February 23rd and 24th.
Aberystwyth, March 9th and 10th.
Bournemouth, March 16th and 17th.

At these examinations 78 candidates presented themselves, and the following were awarded certificates :—

Sanitary Science as applied to Buildings and Public Works.

Evans, Griffith, *Bootle.*

Maternity and Child Welfare Workers.

James, Jane Gatley Dorothy Harvey, *Bideford.*

Health Visitors and School Nurses.

Macarthur, Helen A., *Dorchester.*

School Hygiene, including Elementary Physiology.

Evelyn-Smith, Margery, *Wallingford.*

Sanitary Inspectors.

Acton, Allan Joseph, *Lytton.*
Bennett, Albert George, *Brisbane.*
Bradford, Herbert, *Clayfield.*
Burke, Michael, *Lytton.*
Coleman, Herbert, *Portsmouth.*
Coleman, George, *Portsmouth.*
Dearlove, Janet Lottie Moritza, *St. Peters.*
Degney, James, *S. Brisbane.*
Farling, Ernest Edwin, *Portsmouth.*
Farr, Edward Charles, *Devonport.*
Gammie, Alexander, *S. Brisbane.*
Garland, Alfred Thomas, *Plymouth.*
Good, Arthur William, *Taunton.*
Hickson, Gladys Winifred, *St. Austell.*
Hughes, Thomas, *Rhos.*
Lupton, William Arthur, *Wynnum South.*
Mason, Fred Walter, *Portsmouth.*
Matheson, James Munro, *Toowoomba.*
McIntyre, Arthur Thomas, *Ballina.*

MILLICAN, FRANK HERBERT, *Portsmouth.*
PANNELL, ERIC JAMES, *S. Brisbane.*
PARR, LESLIE WILLIAM, *Windsor.*
PAYNE, FREDERICK ROBERT, *Portsmouth.*
POLMEER, ARTHUR JOHN, *S. Brisbane.*
PRATT, THOMAS ANDREW, *Manly.*
RANCE, HENRY JOHN, *London.*
RICHARDSON, GEORGE HENRY, *Maryborough.*
ROBINSON, ROBERT REFERENDUM, *S. Brisbane.*
ROE, THOMAS JOSEPH, *Brisbane.*
SMITH, WILLIAM, *Newmarket.*
STOCK, ESRIC WILLIAM, *Kenmore.*
SWIM, ALEXANDER CHARLES, *Brisbane.*
SYCAMORE, ALFRED JOHN, *S. Brisbane.*
WIDDICOMBE, WILLIAM HENRY COMPTON, *Shepton Mallet.*

GENERAL NOTES.

The Institute has given its patronage to the Congrès International d'Urbanisme et d'Hygiène Municipale organised by the Société Française des Urbanistes, and which is to be held at Strasburg from July 15th to 18th, 1923.

This meeting also has the patronage of many Learned and Scientific Bodies in France and other countries.

The work of the Congress is divided into 4 sections: (1) Legislation, (2) Town Planning, (3) Municipal Hygiene, (4) The Dwelling. The programme includes visits to the Strasburg Exhibition, to the Municipal Works at Strasburg, to Mulhausen, and other places.

Particulars of the Congress can be obtained from the Commissary General, M. Albert Lorenty, 10, Rue Lavoisier, Paris (VIIIe.).

THE DOCTOR SOFIE A. NORDHOFF-JUNG CANCER RESEARCH PRIZE.

Dr. Sofie A. Nordhoff-Jung, of Washington, District of Columbia, United States of America, has founded an annual prize of five hundred dollars bearing the title of " The Sofie A. Nordhoff-Jung Cancer Research Prize." This prize is destined for the encouragement of researches in the etiology, prevention and treatment of cancer. It will be awarded by a commission, composed of members of the University of Munich, Bavaria, and be granted for the first time in December in the year nineteen hundred and twenty-three. The commission consists of Professors Borst, Doederlein and Sauerbruch, with Professor von Romberg as chairman. This body is empowered to elect successors. The award will be made as a recognition of the most conspicuous work in the world literature bearing on cancer research, done at a time antecedent to the allotment of the award. Though the prize will not be awarded on a competitive basis, the commission invites all research workers in cancer to submit literature on this subject.—Biological Laboratory, Georgetown University, W. Washington, B.C.

FORTHCOMING MEETINGS.

Sessional Meetings.

Nottingham.—Friday, April 20th, at 5 p.m. in the Exchange Buildings. Discussion on "The Nottingham Venereal Diseases Clinic: its work and its history, as illustrating principles upon which schemes for dealing with V.D. Problems should be based," to be opened by Dr. J. C. Buckley. The chair will be taken by Professor H. R. Kenwood, C.M.G., M.B., F.R.S.E., Deputy-Chairman of the Council.

His Worship the Mayor, Alderman Manning, J.P., has kindly arranged to receive the members and to entertain them at tea before the meeting at 4.30 p.m.

On Saturday, April 21st, visits will be made to the V.D. Clinic and Bacteriological Laboratory and the Sherwood Building Estate.

Guildford.—Friday, April 27th, at 6 p.m. in the Guildhall. Discussion on "Things that Matter in Public Health," to be opened by Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P. Hon. Local Secretary, Joseph Cates, M.D., D.P.H., Medical Officer of Health, Surrey C.C. The chair will be taken by Louis C. Parkes, M.D., D.P.H., Chairman of Council. His Worship the Mayor, Councillor J. B. Rapkins, J.P., has kindly arranged to welcome the members, and provide light refreshments after the meeting.

Cambridge.—Saturday, June 23rd. Discussion on "The Grading of Milk," to be opened by J. E. Purvis, M.A., with visits in the afternoon to dairy farm producing "certified" milk and to the Field Laboratories. Hon. Local Secretary, A. J. Laird, M.D., D.P.H., Medical Officer of Health, Cambridge. The chair will be taken by Prof. H. R. Kenwood, C.M.G., M.B., F.R.S.E., Deputy Chairman of the Council.

Ordinary General Meeting.

The Ordinary General Meeting will be held at the Institute on Wednesday, April 25th, at 4.30 p.m. The President, His Grace the Duke of Northumberland, has kindly consented to preside.

Examinations.

In Sanitary Science and for various offices in the Public Health Service:—

Manchester, April 6th and 7th.	London, April 27th and 28th.
Sheffield, April 13th and 14th.	Brisbane, May 2nd and 3rd.
Exeter, April 13th and 14th.	London, May 4th and 5th.
Belfast, April 20th and 21st.	Manchester, May 11th and 12th.

THE THIRTY-FOURTH CONGRESS OF THE INSTITUTE WILL BE HELD IN HULL, FROM JULY 30TH TO AUGUST 4TH, 1923.

PRESIDENT OF THE CONGRESS.
THE RIGHT HON. T. R. FERENS, P.C., J.P.
(HIGH STEWARD OF HULL).

Chairman of Local Committee.
THE RIGHT HON. THE LORD MAYOR OF HULL.
(Councillor C. Raine, J.P.).

Hon. Local Treasurer.
THOS. G. MILNER, F.S.A.A. (City Treasurer and Accountant).

Hon. Local Secretaries.
H. A. LEAROYD, M.A., LL.B., Town Clerk.
J. WRIGHT MASON, M.B.E., M.B., D.P.H., Medical Officer of Health.

Lecture to the Congress.—By SIR ALEXANDER HOUSTON, K.B.E., C.V.O., M.B., C.M., D.Sc., on "A Pure Water Supply."

Popular Lecture.—By B. SEEBOHM ROWNTREE, J.P., on "Industry and National Welfare."

Officers of Sections and Conferences.

A.—Sanitary Science.

President : SIR WILLIAM H. HAMER, M.A., M.D., F.R.C.P., D.P.H.

Recording Secretary : CHARLES PORTER, M.D., B.Sc., M.O.H., St. Marylebone, N.W.I.

Local Secretaries : JAMES A. RAEBURN, M.D., D.P.H., The Tuberculosis Sanatorium, Cottingham, E. Yorks; H. M. JACKSON, B.A., M.B., D.P.H., The City Hospital, Hedon Road, Hull.

B.—Engineering and Architecture.

President : Alderman WILLIAM CARTER FENTON, F.R.I.B.A., The Right Hon. the Lord Mayor of Sheffield.

Recording Secretary : Prof. E. R. MATTHEWS, M.Inst.C.E., F.R.S.Ed., F.G.S., H.M. Office of Works, S.W.I.

Local Secretaries : Major JOHN M. DOSSOR, F.R.I.B.A., 135, Westbourne Avenue, Hull; Major W. S. WALKER, F.R.I.B.A., 77, Lowgate, Hull.

C.—Maternity and Child Welfare, including School Hygiene.

President : J. R. Kaye, M.B., C.M., D.P.H.

Recording Secretary : Harold Kerr, O.B.E., M.D., D.P.H., Medical Officer of Health, Newcastle-upon-Tyne.

Local Secretaries : Katherine Gamgee, M.R.C.S., L.R.C.P., Maternity and Child Welfare, Guildhall, Hull; Dr. Lillias Hardie, School Medical Department, 74, Beverley Road, Hull.

D.—Personal and Domestic Hygiene.

President : The Lady Mayoress of Hull.

Recording Secretary : Councillor Mrs. M. Hatfield, 16, Alliance Avenue, Hull.

Local Secretaries : Sister Edith, 69, Salmon Grove, Cottingham Road, Hull;

I.—Representatives of Sanitary Authorities.

President : The Right Hon. the Lord Mayor of Hull, Councillor Charles Raine, J.P.

Recording Secretary : T. W. Naylor Barlow, O.B.E., M.R.C.S., L.R.C.P., D.P.H., Medical Officer of Health, Wallasey.

Local Secretaries : Councillor Percy Hall, M.R.C.S., L.R.C.P., 10, Albion Street, Hull; Councillor W. E. Copeland, 5, Melwood Crescent, Melwood Grove, Hull.

II.—Representatives of Port Sanitary Authorities.

President : Alderman Francis Askew, J.P., Chairman Hull and Goole Port Sanitary Authority.

Recording Secretary : W. M. Willoughby, B.A., M.D., D.P.H., Medical Officer of Health, Port of London, Greenwich.

Local Secretaries : A. M. Erskine, M.D., D.P.H., Port Medical Officer of Health, Goole; P. Morrison Tolmie, F.R.C.P., D.P.H., Assistant Port Medical Officer, Hull.

III.—Medical Officers of Health.

President : T. Eustace Hill, O.B.E., M.A., D.Hy., B.Sc., M.B., F.I.C.

Recording Secretary : Joseph Cates, M.D., B.Sc., D.P.H., Medical Officer of Health, Surrey County Council, Kingston-upon-Thames.

Local Secretaries : R. Raines, M.R.C.S., L.R.C.P., D.P.H., 443, Beverley Road, Hull; J. M. Hermon, M.D., C.M., The Weir, Hessle, E. Yorks.

IV.—Engineers and Surveyors.

President : E. J. Elford, M.Inst.C.E.

Recording Secretary : Edward Willis, M.Inst.C.E., F.S.I., Engineer and Surveyor, Chiswick.

Local Secretaries : T. Thomas, City Engineer's Department, Hull;

V.—Veterinary Inspectors.

President : O. Charnock Bradley, M.D., D.Sc., M.R.C.V.S.

Recording Secretary : J. R. Hayhurst, M.R.C.V.S., D.V.S.M., Metropolitan Cattle Market, Islington, N.

Local Secretaries : H. P. Lewis, M.R.C.V.S., Chief Veterinary Inspector, Hull; A. J. Hines, M.R.C.V.S., Pelham Cottage, Brighowgate, Grimsby.

VI.—Sanitary Inspectors.

President : W. Holmes, Chief Sanitary Inspector, West Riding, Yorks. County Council.

Recording Secretary : T. Foley Cass, Chief Sanitary Inspector, Hull.

Local Secretaries : R. Martin, Housing Department, Guildhall, Hull;

VII.—Health Visitors.

President : Prof. H. R. Kenwood, C.M.G., M.B., D.P.H., F.R.S.E.

Recording Secretary : Miss M. Harrison, Superintendent Health Visitor, Hull.

Local Secretaries : Mrs. E. J. Clatworthy, 216, Anlaby Road, Hull; Miss H. Garner, Health Department, County Hall, Beverley.

Members proposing to submit papers for reading in Sections or Conferences, are asked to send in the titles of their papers at once, and the manuscripts for consideration of the Committee not later than June 25th.

The Health Exhibition will be held in the Wenlock Barracks, Anlaby Road, from July 30th to August 4th, 1923.

Reduced Railway Fares.—Arrangements have been made with the Railway Companies to issue return tickets to Hull at a single fare and a third, available from July 28th to August 6th. A certificate to obtain reduced fares will be forwarded with the Congress tickets.

LIST OF MEMBERS AND ASSOCIATES.

ELECTED, MARCH, 1923.

MEMBERS.

* Qualifying for Membership Certificate.
§ Sanitary Surveyor's (India) Certificate.
m Meat Inspector's Certificate.
Smoke Inspector's Certificate.
‡ Sanitary Inspector's Certificate.

5069 1923 Mar. ALLSOP, George Wilfred, F.R.I.B.A., *212, Victoria Arcade, Auckland, New Zealand.*

5070 1923 Mar. ASPINALL, Samuel Rigby, *38, South Drive, Chorltonville, Manchester.*

5071 1923 Mar. BANERJEE, Sudhir Ranjan, *Office of Superintending Engineer, Public Health Dept., Bihar and Orissa, P.O. Patna, E.I.Ry., India.*

5072 1923 Mar. BRICKNELL, Frederick William, M.INST.C.E., *City Engineer, Guildhall, Hull.*

5083 1923 Mar. ‡*m*CLINCH, Herbert George, *64, Blackwood Grove, Halifax.*

5073 1923 Mar. COLE, Thomas Philips, M.B., B.S., D.P.H., *(M.O.H.), "Southleigh," Annandale Avenue, Bognor, Sussex.*

5074 1923 Mar. GRAHAM, Judson Vye, M.D., C.M., *51, Coburg Road, Halifax, Nova Scotia, Canada.*

5075 1923 Mar. HAUGH, James P., P.A.S.I., M.INST.M.&C.E., *Deputy Engineer, 107, Blow Road, Pontypridd, S. Wales.*

5076 1923 Mar. MARTINEAU, Georges Elie, M.D., D.P.H., *Medical Superintendent, Quarantine Station, Grosse Isle, Quebec, Canada.*

5077 1923 Mar. MILNE, George Lawson, M.D., *Medical Inspector of Immigration, 618, Dallas Road, Victoria, British Columbia.*

5086 1923 Mar. NADEAU, Emile, M.D., D.P.H., *Quebec Immigration Hospital, Quebec, Canada.*

5078 1923 Mar. ‡OGDEN, Albert Denton, *"Springcliffe," Otley, Keighley, Yorks. (Investigator to the Industrial Fatigue Research Board (Medical Research Council)).*

5084 1923 Mar. §RAO, Kanuparti Hanumanta, *District Health Inspector, Tiruvur Range, Kistna District, Madras Presidency, India.*

5079 1923 Mar. RUTHERFORD, Robert Thomas, M.D., C.M., *Quarantine Officer, St. John, N.B., Canada.*

5087 1923 Mar. SCOTT-MONCRIEFF, Major-General Sir George Kenneth, K.C.B., K.C.M.G., C.I.E., *31, Ladbroke Square, W.11.*

5080 1923 Mar. Singh, Jawand, B.Sc.(Glas.), A.M.Inst.C.E., *P.W.D., New Capital Works, Raisina, Delhi, India.*

5081 1923 Mar. Szapary, His Excellency Count László, *Hungarian Minister, Hungarian Legation, 47, Cadogan Place, S.W.1.*

5082 1923 Mar. ‡*m*Traviss, Frederick Edwin, *6, Norfolk Road, Dorking.*

5085 1918 May. ‡Walker, Edward, *Clifton House, Springfield Road, Sale, Ches.*

ASSOCIATES.

9022 1923 Mar. ‡Anchor, Joseph Spencer, *8, Queen's Avenue, Frankton Junction, New Zealand.*

9023 1923 Mar. ♀Evans, Miss Ethel Louise, *The Nurses' Home, Howards Road, Plaistow, Essex.*

9024 1923 Mar. ‡Hague, Harold Hudson, *The Public Health Dept., Bank House, Colne, Lancs.*

9025 1923 Mar. ‡Hunter, Harry Garth, *30, Church View, Aynam Road, Kendal, Westmorland.*

9026 1923 Mar. ‡Irving, Robert Davidson, *11, William Street, Penrith, Cumberland.*

9027 1923 Mar. ‡Jordan, Ernest Edward, *Kinsley House, Tremont Road, Llandrindod Wells.*

9028 1923 Mar. ‡Leaper, Harry, *11, Upper Shaw Hill, Halifax.*

9019 1923 Mar. Marsh, Cyril Samuel, *2, Brudenell Road, Upper Tooting, S.W.17.*

9029 1923 Mar. ‡Morgan, Mrs. Tydvil Gwendoline, *Cartrefle, Caeracca, Pant Dowlais, Glam.*

9020 1923 Mar. Mukherjee, Pulin Behary, *Contractor, 34, Baloram Dey Street, Calcutta, India.*

9030 1923 Mar. ‡Murray, William Willison, *Sanitary Inspector, Hamilton, Waikato, Auckland, New Zealand.*

9031 1923 Mar. ♀Phipps, Miss Maud Ann, *Health Visitor, Atherstone, Warwicks.*

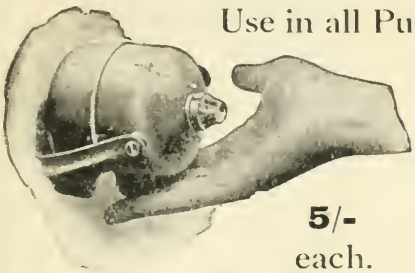
9032 1923 Mar. ‡Royall, James Frederick Charles, *47, Christ Church Road, Norwich.*

9021 1923 Mar. Somerfield, Miss Alberta, *Health Visitor, Argyle House, Church Road, Cinderford, Glos.*

9033 1923 Mar. ‡Turner, Frederick John, *9, Allenby Square, Trent Vale, Stoke-on-Trent.*

HORTON LIQUID SOAP

prevents the Possibility of Infection

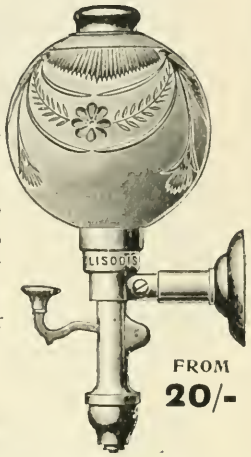


Use in all Public Lavatories for

Economy (50% saving over tablet soap).

Efficiency (Patented, locked, all metal, unbreakable, fool-proof containers).

Hygiene (each user gets fresh soap).



FROM **20/-**

5/- each.

1,000 Rations for 1/-.

Prevents WASTE, PILFERING, INFECTION

HORTON JELLY CLEANSER, an odourless, non-lathering disinfectant Soft Soap for use with a mop (can be carbolised if required).
Unrivalled for the rapid cleansing of floors, paintwork, tiles, linoleums, etc.
50 per cent. Economy—100 per cent. Efficiency.

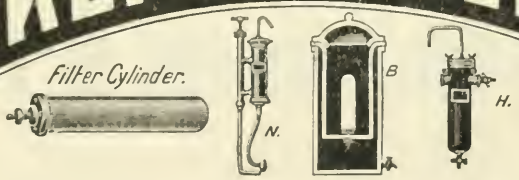
HORTON MANUFACTURING CO., Ltd., RICKMANSWORTH, HERTS.

BRITISH OWNED

SARDINIA HOUSE, KINGSWAY, LONDON, W.C2

THE BRITISH BERKEFELD FILTER

Filter Cylinder.



H.H.BROWNLOW.
R.S.BROWNLOW.

"DURESCO"

WASHABLE WATER PAINT.

Sole Manufacturers:

THE SILICATE PAINT CO., Ltd., Charlton, London, S.E.

"MINIMAX"

Chemical Hand FIRE Extinguisher.

CLAIMS—

EFFICIENCY

RELIABILITY

INSTANTANEOUS ACTION

One INITIAL COST secures continuous protection

PROOFS—

Thousands of Testimonials reporting INSTANT and EFFECTIVE ACTION YEARS AFTER Installation

Free Refills after Fire

Free Inspections

Please apply for full particulars to—

MINIMAX LTD., Head Office and Works **(Box 151), Feltham, MIDDLESEX.**

("Minimax"—Regd. Trade Mark).

THE ROYAL SANITARY INSTITUTE,

90, Buckingham Palace Road, S.W. 1.

THE PARKES MUSEUM OF HYGIENE.

The Exhibits illustrate BUILDING MATERIAL, HOUSE DRAINAGE, SANITARY APPLIANCES, HEATING and VENTILATION, WATER SUPPLY, FOODS, INFANT HYGIENE, DISINFECTION, &c., &c.

The Museum is OPEN TO THE PUBLIC WITHOUT CHARGE

Daily from 9.30 a.m. to 5.30 p.m.; on Mondays till 7 p.m.

Descriptive Catalogues of the Sections of the Museum are in course of preparation. Those already published, price 6d. each, are "House Drainage,"—"Infant Hygiene"—"Sanitary Appliances and Waste Preventers"—"Parasites and Flies, which cause Disease of Man."

A REAL POISON.

"Like many other forms of low life, rodents will only succumb to a real poison, and the great difficulty has always been to effectually disguise the medium used. In 'Rodine' you have more than succeeded." So writes a Biological Expert regarding Rat Extermination.

It is noteworthy that Authorities and Officials whose business it is to enforce the "Rat Destruction Act" declare that "Rodine" is the one means that ensures success. When difficulties have to be faced in Rat Extermination they always send for "Rodine." It is fascinating and fatal to rats. Tins, 7½d., 1/3, 2/6, post 3d ; 5/-, post 6d. *For special discounts on quantities write the Maker :—*

T. HARLEY, Manufacturing Chemist, PERTH, SCOTLAND.

Royal Sanitary Institute

Patron—HIS MAJESTY THE KING.

COURSES OF LECTURES,

Including Practical Demonstrations and Inspections, are held by the Institute in London, twice yearly, Spring & Autumn.

For Sanitary Officers
„ Health Visitors & Child Welfare Workers
„ Meat Inspectors
„ Army Officers and Professional Men.

EXAMINATIONS.

SANITARY SCIENCE.
SANITARY INSPECTORS.
MEAT INSPECTORS. SCHOOL HYGIENE.
SMOKE INSPECTORS.
HEALTH VISITORS AND SCHOOL NURSES.
MATERNITY & CHILD WELFARE WORKERS.
TROPICAL HYGIENE.

CENTRES FOR 1923.

Aberdeen	Dublin	Manchester
Aberystwyth	Edinburgh	Newcastle
Belfast	Hereford	Nottingham
Birmingham	Hull	Plymouth
Bournemouth	Leeds	Preston
Bristol	Liverpool	Sheffield
Cardiff	London	

THE CERTIFICATES are officially recognised as qualifications for appointments by Government Departments and Municipal Authorities.

APPLICATION FORMS and full particulars can be obtained from the SECRETARY, 90 Buckingham Palace Road, London, S.W. 1.

"There's many a slip—"

and if you have not taken every possible precaution to ensure safety on your staircase, you are responsible for those slips and the dangers incurred. Is it worth while running the risk ?

If you fit Ferodo Stair Treads you ***are*** taking every possible precaution—you are providing the finest and safest non-slip surface at present obtainable. Without alteration to your existing stairway you can instal Ferodo Stair Treads, you have a choice of attractive colours and designs, and you have the knowledge that you have a really safe staircase.

Made of firmly woven fabric, chemically treated to outwear cast iron, Ferodo Stair Treads are noiseless, non-slipping, and attractive.

FERODO
REGISTERED

PATENT STAIR TREADS

are not limited to one type of staircase. They are produced in colours and may be fitted to steps of wood, marble, stone, or iron. Our Illustrated List gives full description with colours, types, and prices. Send for a copy to-day.

FERODO, Ltd., CHAPEL-EN-LE-FRITH.

30

MASTER MINDS
USE
"CHLOROS"
THE
MASTER DISINFECTANT.
CARBOLIC CO-EFFICIENT (Rideal Walker Test) 20.

"**CHLOROS**" is specially suitable for—

Sterilizing Water Supplies and Sewage Works Effluent.

Cleansing and Deodorising Drains, Urinals, Water Closets, and Markets.

Sterilizing Linen and Excreta in Hospitals.

General Disinfection in Schools, Asylums, Hospitals, and Workhouses.

Makers—

The United Alkali Co., Ltd.,

CUNARD BUILDING, LIVERPOOL.

Telegrams: "UBIQUE, LIVERPOOL." **Telephone: BANK 9280.**

HEALTH EXHIBITION,
1923.

The next Exhibition in connection with the 34th Congress of the Institute will be held at

HULL,

from July 30th to August 4th, 1923.

Further particulars can be obtained from—

THE SECRETARY,
The Royal Sanitary Institute,
90, Buckingham Palace Road, London, S.W.1.

ACTIVATED SLUDGE PROCESS

The Diffused Air Method
is
THE MOST ECONOMICAL
and
THE MOST EFFICIENT
for the
Purification of Sewage

Has been adopted by many towns in England, including London, Manchester (three plants), Worcester, Tunstall, Hanley, Reading, Hertford, Irlam; also by H.M. War Office, H.M. Office of Works, H.M. Board of Agriculture; also by towns in India, South Africa, Australia, Canada, France, Denmark, Holland, and other countries.

for the

Purification of Factory Wastes

Has been adopted by Messrs. Cadbury Brothers, Ltd., Messrs. United Dairies, Ltd., and by Messrs. J. S. Fry & Sons, Ltd.

We have received the Highest Award (Silver Medal) at the Health Exhibition of the Royal Sanitary Institute, held at Birmingham, July-August, 1920.

Write for Leaflet R.S.I. (1).

Address all enquiries to—

Activated Sludge Ltd

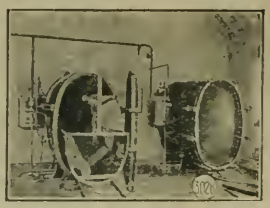
14, HOWICK PLACE, VICTORIA STREET, WESTMINSTER, LONDON, S.W. 1.

Telegrams:
"ACSLUDGETI, SOWEST, LONDON."

Telephone:
VICTORIA 5945.

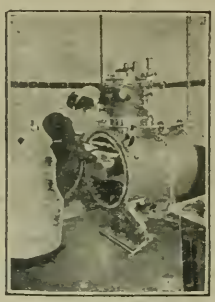
SEND YOUR ENQUIRIES

FOR :—



Steam Disinfectors.

Refuse Destructors.



Steam Sterilizers.

Sewage Ejectors.

Incinerators.

Vermin Killers.

TO :—

MANLOVE, ALLIOTT & Co., Ltd.

BLOOMSGROVE WORKS,

NOTTINGHAM.

London Office: 41 & 42, PARLIAMENT ST., WESTMINSTER, S.W.1

H. R. Grubb, Printer, Poplar Walk, Croydon.